RECORD OF DECISION

Consolidated Iron and Metal Site

City of Newburgh, Orange County, New York

United States Environmental Protection Agency
Region II
New York, New York

October 2006

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

Consolidated Iron and Metal Site
City of Newburgh, Orange County, New York

Superfund Identification Number: NY0002455756

Statement of Basis and Purpose

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for the Consolidated Iron and Metal site, which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §9601, *et seq.*, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the remedy for the site.

The information supporting this remedial action decision is contained in the Administrative Record. The index for the Administrative Record is attached to this document (Appendix III).

The State of New York concurs with the selected remedy.

Assessment of the Site

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of Selected Remedy - Debris Removal, Partial Excavation of Site Soils with Off-Site Disposal, Backfill with Clean Soils, Institutional Controls, and Site Management Plan

The response action described in this document represents the only planned remedy for the Consolidated Iron and Metal site. It addresses metal, polychlorinated biphenyl (PCB), and volatile organic compound (VOC) contamination in the soils and groundwater.

The major components of the selected remedy include the following:

- a remedial design program to provide the details necessary for the construction and monitoring of the remedial program;

- removal and off-site disposal of surface debris and demolition, removal, and off-site disposal of the foundations/basements of the former process area buildings and of the former garage in its entirety;

- excavation and off-site disposal of contaminated soil exceeding the residential preliminary remediation goal (PRG) for lead (400 parts per million (ppm)) down to six feet below ground surface (bgs);

- excavation and off-site disposal of contaminated soil exceeding the PRG for VOCs and PCBs in subsurface soils (10 ppm total for each) to the water table;

- placement of a readily-visible demarcation material at the interface between the excavations and backfill;

- backfilling the excavated soil with clean fill, meeting the PRG values, to grade;

- imposition of institutional controls in the form of an environmental easement and/or restrictive covenant that will at a minimum require: (a) restricting any excavation below the soil cover's demarcation layer of six feet unless the excavation activities are in compliance with an EPA-approved site management plan (SMP); (b) restricting new construction at the site unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in compliance with an EPA-approved SMP; and (c) restricting the use of groundwater as a source of potable or process water unless groundwater quality standards are met;

- development of a site management plan that provides for the proper management of all site remedy components post-construction, such as institutional controls, and that shall also include: (a) monitoring of site groundwater to ensure that, following the soil excavation, the contamination is attenuating and groundwater quality continues to improve; (b) an inventory of any use restrictions on the site; (c) necessary provisions for ensuring the easement/covenant remains in place and is effective; (d) provision for any operation and maintenance required of the components of the remedy, and (e) the requirement that the owner or person implementing the remedy submit periodic certifications that the institutional and engineering controls are in place; and

- periodic reviews by EPA to ensure that the remedy continues to be protective of public health and the environment.

Statutory Determinations

The selected remedy meets the requirements for remedial actions set forth in CERCLA §121. It is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective.

The selected remedy satisfies the statutory preference for permanent solutions. Although the remedy does not satisfy the statutory preference to reduce the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants through treatment, the removal of the top six feet of contaminated soil will eliminate exposure pathways and will not interfere with future development of the site for commercial, recreational, or residential use. The remedy will be protective of the groundwater through the removal of mobile contaminants (*i.e.*, VOCs and PCBs) to the water table and through institutional controls and long-term groundwater monitoring. The SMP will ensure that all parts of the remedy remain protective of human health and the environment.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted no less often than once every five years after completion of the construction of the remedial action to ensure that the remedy continues to be protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this site.

- Chemicals of concern and their respective concentrations (see ROD pages 9 through 18, and TABLES 1 through 5);

- Baseline risk represented by the chemicals of concern (see ROD pages 20 through 24, and TABLES 6 through 11);

- Cleanup levels established for chemicals of concern and the basis for these levels (see ROD page 50, and TABLES 13 and 14);

- Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and ROD (see ROD pages 21 and 50);

- Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see ROD pages 49 and 50, and TABLE 16); and

- Key factor(s) that led to selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)(see ROD pages 45 and 46).

George Pavlou, Director
Emergency & Remedial Response Division
EPA - Region II

10/4/06
Date

ROD FACT SHEET

SITE

Site name:	Consolidated Iron and Metal Site
Site location:	City of Newburgh, Orange County, New York
EPA Region:	II
HRS score:	50.00
EPA Site ID No:	NY0002455756

ROD

Date signed:	October 4, 2006
Operable unit:	None
Selected remedy:	Debris Removal, Partial Excavation of Site Soils with Off-Site Disposal, Backfill with Clean Soils, Institutional Controls, and Site Management Plan
Capital cost:	$19.8 million
Annual O & M cost:	$376,000
Present-worth cost:	$20.1 million

LEAD

United States Environmental Protection Agency

Primary contact:	Michael Negrelli, Remedial Project Manager, (212) 637-4278
Secondary contact:	Kevin Lynch, Chief, Western New York Remediation Section, (212) 637-4287

WASTE

Waste type:	Soil contaminated with metals, polychlorinated biphenyls and volatile and semi-volatile organic compounds
Waste origin:	Operations at the Consolidated Iron and Metal company scrap metal processing business
Contaminated media:	Soil, groundwater

DECISION SUMMARY

Consolidated Iron and Metal Site

City of Newburgh, Orange County, New York

United States Environmental Protection Agency
Region II
New York, New York

October 2006

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SITE NAME, LOCATION AND DESCRIPTION

The Consolidated Iron and Metal site is an inactive car and scrap metal junk yard and dealer located at the foot of Washington Street, in the City of Newburgh, Orange County, New York. The site, which covers approximately seven acres, is bounded by a boat marina to the north, Conrail railroad tracks and South Water Street to the west, an inactive municipal incinerator and an active wastewater treatment plant to the south, and the Hudson River to the east. The site location map is presented as FIGURE 1 and the site map is presented as FIGURE 2.

Downtown Newburgh is located approximately 500 feet west of South Water Street. The City of Newburgh, which is 60 miles north of New York City, is located on the western side of the Hudson River in eastern Orange County. The City has a land area of 3.9 square miles and is bounded by the Town of Newburgh on the north and west, by the Town of New Windsor to the south, and by the Hudson River to the east.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Site History

From World War I until the early 1940s, the Eureka Shipyard operated at the site. Consolidated Iron and Metal Company Inc.'s (Consolidated's) scrap metal processing and storage operations began in the mid-1950's and continued at the site for approximately 40 years before the facility's closure in 1999. A smelter was operated on-site by Consolidated between approximately 1975 and 1995 that was used primarily to melt aluminum-containing materials to produce aluminum ingots. Other metallic materials also were smelted, creating a lead-contaminated ash and slag by-product. Other site operations included sorting ferrous and non-ferrous metal scrap for processing, including automobile batteries. In addition, over the course of time, cars and other metal materials were burned, crushed, baled, sheared, and flattened which led to the release of metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs) at the site.

Historical aerial photographs taken since the mid-1940s show that standing liquids have occupied large areas of the site. Throughout the past 50 years, the site has been covered with piles of debris, scrap metal, numerous small and large mounds of dark-toned and light-toned materials, and numerous areas of dark-stained soil.

From approximately 1960 to 1980, the area of land on which the facility operated increased, by approximately 25 percent, as fill material was added to the Hudson River along the property's shoreline.

From 1997 to 1999, the New York State Department of Environmental Conservation (NYSDEC) conducted several inspections at the site. Oil-stained soils and puddles with oil sheens were observed on-site. In addition, an unpermitted storm water discharge to the Hudson River and an improperly constructed berm were noted. The southern portion of the site was covered by thousands of tires.

Several underground storage tanks (USTs) were removed from the site in the late 1990s. The USTs likely stored fuel oil for the process equipment when the facility was active. The size of the excavations suggested the USTs were at least 5,000 gallons in capacity.

Numerous environmental violations were noted over the years, including, but not limited to, Consolidated's failure to notify EPA of its Resource Conservation and Recovery Act (RCRA) status. The ash/slag pile was determined to be RCRA hazardous waste. In addition, the site owner was in violation of RCRA because of a failure to remove and legally dispose of the tire piles.

Between 1996 and 1999, NYSDEC prosecuted the site owner for five separate environmental violations. The owner pleaded guilty to all violations and paid fines. In 1999, the New York State Attorney General filed a lawsuit against the company for RCRA and Clean Water Act (CWA) violations, including illegal discharge to surface water without a State Pollutant Discharge Elimination System permit. The case was settled with a Consent Order in which the company agreed to remove all scrap materials and cease operations.

In July 1998, the NYSDEC requested that EPA undertake a removal action to remove the ash/slag pile at the site that was generated by the aluminum smelting operation. Sampling of the pile by EPA found it to be contaminated with lead and PCBs. The scrap metal in the pile was segregated out and the resulting fines pile, estimated at 6,600 tons, was removed from the site in 1999 and sent to an approved treatment, storage, and disposal facility (TSDF) for stabilization and landfilling. Also in 1999, EPA sampled another processed soil pile at the site which was also found to be contaminated with lead and PCBs; this soil pile was also transferred by EPA to an approved TSDF. Additionally, EPA removed eighteen drums of liquid waste from the site and constructed a berm from site soils to prevent storm water from carrying site contaminants into the Hudson River.

In December 2000, a Hazard Ranking System package was prepared by EPA utilizing data collected during an integrated assessment at the site. Surface and subsurface soil, groundwater, and sediment samples were collected and analyzed, indicating the presence of VOCs, semi-volatile organic compounds (SVOCs), pesticides, PCBs, and metals at concentrations greater than screening criteria in the surface and subsurface soils. The site was placed on the National Priorities List on June 14, 2001.

In 2002, EPA responded to local concerns about trespassing and scavenging taking place at the site and constructed a security fence around the site. Concurrently, EPA initiated the development of a work plan for the performance of the remedial investigation/ feasibility study (RI/FS). Prior to collecting samples for the RI, it was necessary to clear the site of the excessive debris and some of the structures located on-site. Accordingly, from June to September 2003, EPA conducted a site clearing operation which included the following tasks:

- the removal of 32 truckloads of tires (approx. 30,000 tires total);
- the removal of 58 truckloads (1,450 tons) of scrap metal for recycling;
- the removal of 19 roll-offs (380 tons) of concrete for recycling;
- the disposal of 68 truckloads (1,962 tons) of lead-hazardous soil and debris;
- the demolition and removal of the office building and 3 process buildings;
- the pumping and removal of approximately 28,000 gallons of hydraulic oil from the metal shear building basement for recycling; and
- rough grading of the site surface.

Completion of the site clearing enabled the initiation of the RI sampling program, which began in June 2004.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan addressing contamination at the site was prepared by EPA and released in July 2006. A notice of the Proposed Plan and public comment period was placed in the Times Herald Record on July

25, 2006 and the Mid-Hudson Times on July 26, 2006, consistent with the requirements of the NCP 40 CFR §300.430(f)(3)(i)(A). The public notice established a thirty-day comment period from July 25, 2006 to August 23, 2006. In response to two written requests to extend the public comment period, the comment period was extended to September 22, 2006. A second notice was placed in the Times Herald Record on August 12, 2006 and the Mid-Hudson Times on August 16, 2006 to announce the thirty-day extension of the comment period. The Proposed Plan and all relevant documents in the Administrative Record (see Administrative Record Index, Appendix III) were made available to the public at two information repositories, namely: the EPA Superfund Records Center at 290 Broadway, New York, New York 10007 and the Newburgh Free Library, 124 Grand Street, Newburgh, New York 12550.

EPA hosted a public meeting on August 7, 2006 at Newburgh City Hall to discuss the Proposed Plan and the alternatives considered for the site. At this meeting, representatives from EPA answered questions about the contamination at the Superfund site and the proposed remedial alternative. EPA's responses to comments received during the public meeting, along with responses to other written comments received during the public comment period, are included in the Responsiveness Summary (APPENDIX V).

SCOPE AND ROLE OF RESPONSE ACTION

Cleanup at the site is currently being addressed as one operable unit (OU). As noted above, to date, the following removal action has occurred at the site:

- the 1999 ash/slag pile removal phase;
- the 1999 processed soil pile, berm construction, and drum removal phase;
- the 2002 security fence installation phase; and
- the 2003 site clearing phase, consisting of the removal of tires, scrap metal, concrete and building materials, soil and debris, and hydraulic oil.

This ROD describes the comprehensive long-term remediation plan for the entire site and is expected to be the only ROD issued for the site.

SUMMARY OF SITE CHARACTERISTICS

Site characteristics are described more completely in the RI report, which was finalized by EPA in July 2006. The purpose of the RI was to define the nature and extent of contamination in on-site surface and subsurface soils, surface water and sediment in the Hudson River adjacent to the property, and groundwater. EPA's fieldwork for the RI was conducted from April 2004 to November 2004.

To determine which media (soils, sediment, surface water, or groundwater) contain contamination at levels of concern, the analytical data were compared to applicable or relevant and appropriate requirements (ARARs), or other relevant guidance if no ARARs were available.

Results of these investigations are summarized below.

Physical Site Conditions

The site lies in the Lower Hudson Valley, on the west bank of the Hudson River in an area of relatively low topographic relief known as the Hudson-Champlain Lowlands of eastern New York. The site is located on a relatively flat area at an elevation of approximately 40 feet above mean sea level (msl) and about 10 feet above the adjacent Hudson River (at mean low tide elevation). According to a Flood Insurance Rate Map, the eastern portion of the site next to the Hudson River is located within Zone B, an area between the limits of 100-year floods and 500-year floods, and the western portion of the site is within Zone C, an area of minimal flooding.

Geology and Hydrogeology

<u>Site Geology</u>

Geologically, the site is underlain by a stratified clay, silt and sand unit with layers of sand and gravel at the land surface and below the water table. The unconsolidated deposits are underlain by the Martinsburg Formation, which consists of shale and carbonate rocks (*e.g.*, limestones and dolostones). The bedrock is cross-cut by faults near the site.

The lithologic descriptions from soil borings indicate the following deposits are present, as shown on the geologic cross section across the center of the site (FIGURE 3).

Fill: Fill deposits are primarily confined to the top 20 feet of material at the site. The lithology includes a mixture of yellow, brown, greyish green, and black, fine- to coarse-grained sand, gravel, and trace silt with bricks, concrete, rebar, metal, glass, wood, ash, cinders, and plastic.

Sand/Gravel: Native deposits, which underlie fill deposits, consist of a mixture of yellow, brown, greyish green, and black, fine- to coarse-grained sand, gravel, and trace silt.

Clay: Clay lenses occur as thin, non-continuous layers within the fill and native sand and gravel deposits. The lenses are made up of a tan to dark greenish gray, medium to stiff clay. In some instances, these layers cause perched water table conditions. A thicker clay layer was observed below the native sand/gravel deposits, in some of the deeper borings. The clay was gray, loose to stiff, and plastic. The top of the clay was observed in two soil borings and three monitoring well borings at depths that increased from west to east. Depths to the top of clay ranged from 22.5 feet in the southwest corner of the site (MW-9) to 31 feet bgs at MW-5, which is the eastern-most location in which the clay was observed.

Bedrock: Weathered bedrock was encountered at only one vertical profile boring in the northwest corner of the site (MW-1), at a depth of 38 feet bgs. Although drilling did not advance through the bedrock at this location, the depth is consistent with 20 to 60 foot depths encountered during investigations at the nearby manufactured gas plant site to the south and west of the Consolidated Iron site. Depth to bedrock across the rest of the site has not been defined. Bedrock is a dark gray shale belonging to the middle Ordovician Martinsburg Formation.

Site Hydrogeology

The unconsolidated water table aquifer, which overlies the low permeability bedrock aquifer, is comprised of fill material underlain by native sand and gravel with localized silt lenses. The water table aquifer varies in thickness across the site, averaging approximately 20 feet thick. All of the site monitoring wells are installed within this aquifer.

Synoptic water level measurements were collected prior to each round of monitoring well sampling. Based on the two rounds of synoptic water level measurements, groundwater flows to the east/southeast toward the Hudson River. The water table at the site is generally flat, with elevations in August 2004 ranging from 3.18 feet above msl (14.43 feet bgs) at MW-1 in the northwest corner of the site, to 0.44 foot above msl (11.97 feet bgs) at MW-7 in the southeastern part of the site. A second round of measurements in November 2004 followed the same pattern, with flow to the east/southeast, toward the Hudson River. FIGURE 4 illustrates water table contours for measurements collected in November 2004.

Groundwater flow gradients vary across the site; overall gradients from the two rounds of data ranged from 0.0036 to 0.0107. Steeper gradients are present at the northern and southern ends of the site, with a shallower gradient across the center of the site.

Slug tests were conducted at all nine monitoring wells to estimate hydraulic conductivity and specific capacity of the aquifer. The hydraulic conductivity values range from a minimum of 0.33 foot per day (ft/d) at MW-8 to a maximum of 78.2 ft/d at MW-6. The average hydraulic conductivity from all site wells is 18.9 ft/d.

Groundwater flow velocity across the site was calculated using the site average hydraulic conductivity of 18.9 ft/d, the hydraulic head gradient of 0.0066 from the second round of groundwater elevation measurements, and an assumed porosity for a medium sand of 30 percent. The average groundwater flow velocity across the site is 0.42 ft/d.

The potable water source for the City of Newburgh is surface water drawn from Washington Lake located west of the City in the Towns of New Windsor and Newburgh. Two additional sources of water are available to the City, including Brown's Pond (also known as Silver Stream Reservoir) and New York City's Catskill Aqueduct. According to the Newburgh Water Department, no potable water supply wells are active within the City of Newburgh. The nearest public supply wells are located over two miles to the northeast of the site, across the Hudson River in Dutchess County.

Remedial Investigation Results

The field work and sampling performed during the RI characterized the nature and extent of contamination in the soils, surface water, sediment, and groundwater at the site. A general discussion of these findings is presented below. The RI report contains a more complete examination of the analytical results. This information is available in the Administrative Record (index attached as APPENDIX III).

Screening Criteria

Site-specific screening criteria were evaluated for all compounds for which samples were analyzed. The nature and extent of contamination discussion focuses on contaminants that exceed site-specific screening criteria. Generally, for each medium, the site-specific screening criteria is the most conservative value of the Federal or State value. The site-specific screening criteria utilized in this evaluation are as follows:

Soil Screening Criteria: Site-specific soil screening criteria include the following:

- EPA Region IX residential soil preliminary remediation goals (PRGs), adjusted to a cancer risk of $1x10^{-6}$ and a non-cancer hazard index of 1.0;
- EPA Generic Soil Screening Levels (SSLs) for commercial/industrial - ingestion/dermal scenarios;
- EPA Generic SSLs for commercial/industrial - inhalation scenarios; and
- NYS Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, No. 94-HWR-4046, January 24, 1994, adjusted for the site-specific total organic carbon (TOC) concentration of 4.85 percent.

Sediment Screening Criteria: The site-specific sediment screening criteria include the following:

- NYS Sediment Screening Criteria for Human Health (bioaccumulation, freshwater);
- NYS Sediment Screening Criteria for Benthic Aquatic Life (chronic toxicity, freshwater);
- NYS Sediment Screening Criteria, Aquatic Life (severe effect level for inorganics);
- MacDonald (2000) Consensus-based Probable Effect Concentrations; and
- EPA Region IX industrial/commercial soil.

Surface Water Screening Criteria: The site-specific surface water screening criteria include the following:

- EPA Ambient Water Quality Criteria, Human Health (for Consumption of organisms only) values;

- EPA Ambient Water Quality Criteria, Aquatic Life (chronic fresh water) values;
- NYS Standards and Guidance Values for Class B Surface Water, Human Health (fish consumption) values; and
- NYS Standards and Guidance Values for Class B Surface Water, Aquatic Life (chronic) values.

<u>Groundwater Screening Criteria</u>: The site-specific groundwater screening criteria include the following:

- National Primary Drinking Water Standards;
- NYS Standards and Guidance Values and Groundwater Effluent Limitations for Class GA Groundwater (human water sources); and
- NYS Department of Health (NYSDOH) Drinking Water Quality Standards.

<u>Indicator Contaminants</u>

Indicator contaminants were selected to focus the evaluation of the nature and extent of contamination in soil, sediment, surface water and groundwater. As a first step in the indicator contaminant selection process, analytical data collected during the RI were evaluated for frequency of detections and magnitude of exceedances of screening criteria. The Human Health Risk Assessment (HHRA) contaminants of potential concern (COPC) were reviewed to determine which contaminants contributed the most to risks and historical activities and analytical data were reviewed to determine which contaminants were related to site operations.

Based on the selection process, the indicator contaminants include:

- Benzo(a)anthracene
- Benzo(b)fluoranthene
- Benzo(a)pyrene
- Indeno(1,2,3-c,d)pyrene
- Dibenzo(a,h)anthrace
- Aroclor-1254[1]
- Arsenic
- Cadmium
- Copper
- Iron
- Lead
- Mercury
- Vanadium
- Zinc

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[1] Aroclor-1254 is a specific PCB, one of a number of aroclors, meeting the definition of Indicator Contaminant for the site. The cleanup goal for PCBs in site soils, discussed later in this document, is based on total PCB concentrations, not on individual aroclors.

In addition, VOCs are considered indicator contaminants for groundwater. The nature and extent of contamination discussions focus on the listed indicator contaminants.

Soil Samples

Two types of soil samples were collected from 21 soil borings in the process area and 37 borings in the site-wide area[2] (see FIGURE 5). The two types of soil samples include "screening samples," an economical and easily implemented sampling process, whereby analysis is performed in the field using methods that generally indicate the contaminants present in site soils, and "analytical samples," whereby analysis is performed in a laboratory to more precisely quantify the contaminants in site soils. On-site screening for lead, VOCs, and PCBs was performed on 133 soil samples from the process area and 208 soil samples from the site-wide area, for a total of 341 soil screening samples. Laboratory analysis was performed on 23 surface (0-1 foot bgs) and 24 subsurface soil (2-4 feet bgs) samples from the process area, and 39 surface and 40 subsurface soil samples from the site-wide area, for a total of 126 soil analytical samples.

Soil Screening Sample Results:

Lead Soil Sample Screening Results: Lead contamination exceeding the screening criterion of 400 milligrams per kilogram (mg/kg, equivalent to parts per million (ppm)) occurred in all soil borings and at all depth intervals. In general, the highest lead concentrations in the process area soil borings occurred in the top 4 feet of soil, ranging from 280.5 mg/kg to 19,798.4 mg/kg. Lead concentrations in the site-wide soil borings were generally lower than those in the process area soil borings; however, concentrations in the deeper intervals tended to be higher than those at similar depths in the process area. Higher concentrations also occurred in the southern part of the site, near the former scrap metal and tire piles. The highest levels were in boring SWSB-30 (15,714 mg/kg in the 6-8 foot interval) and SWSB-33 (14,200.9 mg/kg in the 4-6 foot interval).

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[2] The term "process area" is used to describe the area of the site in which the metal shear, compactor/bailer, and smelter buildings were located; the term "site-wide area" is used to describe locations outside the process area.

VOC Soil Screening Results: Total VOC screening was conducted on 153 samples from process area soil borings and on 164 samples from site-wide soil borings. Process area screening sample concentrations ranged from non-detect to 129 ppm, with the highest reading in the surface at PASB-05, located in the area of the former metal shear building. In general, the highest concentrations in each boring were observed in the top six feet of soil.

Although total VOCs were detected in a lower percentage of site-wide soil samples than process area soil samples, the highest overall concentrations were in site-wide soil borings. The highest concentrations were detected in the surface at SWSB-15, located approximately 220 feet east of the former compact/bailer building; total VOCs were detected at 1,835 ppm in the 0-2 foot interval and at 1,054 ppm in the 2-4 foot interval.

PCB Soil Screening Results: PCB screening was conducted on 87 samples from process area soil borings and on 181 samples from site-wide soil borings. In general, PCB screening results indicated total PCBs exceeded the screening criterion in the majority of the soil samples. In general, the highest concentrations of total PCBs were in surface soils east of the former compactor/bailer building and south of the former metal shear building. The highest overall concentration in the process area was 52.87 mg/kg, detected in the surface at PASB-10, approximately 50 feet east of the former compactor/bailer building, and in the former ash/slag pile.

In general, total PCB levels in samples from site-wide soil borings were lower than those from process area soil borings. Higher levels were also found at deeper depths than in process area soil borings. The highest PCB levels in site-wide soil borings were generally found in two areas: in the northeast corner of the site, in the area of a former processed soil pile, and in the southeast, downgradient of the former smelter and staging area. The highest levels were detected at the 8-10 foot intervals at SWSB-28 (45.6 mg/kg) and SWSB-34 (20.81 mg/kg), both located in the southeast corner. SWSB-05 and SWSB-37, both located in the northeastern corner, had PCBs at 14.16 mg/kg (0-2 feet) and 8.49 mg/kg (4-6 feet), respectively.

The following sections summarize the results for analytical samples in site media.

Soil Sample Indicator Contaminant Results

Screening criteria exceedances for all contaminants in process area soil boring samples and site-wide boring samples, including indicator contaminants, are presented in TABLES 1 and 2.

<u>PAHs</u>: All five PAH indicator contaminants were detected in soil samples in both the process area and site-wide soil borings; levels were generally higher in the surface soils. Of the PAH indicator contaminants, benzo(a)pyrene exceedances were the most prevalent, with screening criterion exceedances in every surface and subsurface soil sample across the site. Concentrations ranged from 240J[3] micrograms per kilogram (ug/kg, equivalent to parts per billion (ppb)) to 23,000 ug/kg, with the highest levels in surface soils concentrated around the former metal shear building (PASS-04 and PASS-02), northeast of the former metal shear building (SWSS-06) and on the eastern side of the site along the Hudson River (SWSS-16). Subsurface soil levels ranged from 120J ug/kg to 22,000J ug/kg, with the highest levels in the northwest part of the site (SWSB-06) and adjacent to the Hudson River, east of the former metal shear building (SWSB-13 and SWSB-36).

The PAHs benzo(a)anthracene, benzo(b)fluoranthene, and indeno(1,2,3-c,d)pyrene were also detected in every surface soil sample across the site, with exceedances in the majority of locations. The levels and distribution of these indicator contaminants are similar to benzo(a)pyrene, although there are fewer screening criteria exceedances. Dibenz(a,h)anthracene exceeded screening criteria in the majority of surface soil samples.

<u>PCBs</u>: Aroclor-1254 exceeded the screening criterion in all but one surface soil location, with concentrations ranging from 70J ug/kg to 35,000 ug/kg. Exceedances in the subsurface soil were generally lower, with ranges from 140 ug/kg to 27,000 ug/kg. The highest levels in both surface and subsurface soil were in PASS/PASB-05 and surrounding areas, near the former metal shear building. FIGURES 6 and 7 show isoconcentration contours for total PCBs in the surface and subsurface soils, respectively.

<u>Inorganics</u>: Five of the inorganic indicator contaminants (arsenic, copper, iron, vanadium, and zinc) exceeded screening criteria in every surface and subsurface soil sample. Arsenic levels ranged from 7 mg/kg to 39.8 mg/kg in surface soils, with elevated levels

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[3] The letter "J" is a convention used in data reporting to indicate that a value is estimated.

around the former metal shear and compactor/bailer buildings. In subsurface soils, exceedances ranged from 4.8 mg/kg to 73.1 mg/kg, with the highest concentration located at the southwest corner of the former smelter building. Elevated levels were also found near the former metal shear and compactor/bailer buildings.

The highest copper concentration in the surface soils was 11,000 mg/kg, in PASS-19, between the former compactor/bailer and smelter buildings. The highest concentration in the subsurface was 6,650 mg/kg, in PASS-11, located near the northeast corner of the former metal shear building.

The highest iron concentration in the surface soils was 111,999 mg/kg in SWSS-11-D, on the north side of the former metal shear building. The highest concentration in the subsurface was 153,000 mg/kg, in PASB-05, adjacent to SWSS-11.

Vanadium concentrations in surface soils ranged from 33.5 mg/kg to 760 mg/kg, with the highest levels in SWSS-37-D, in the northeast corner of the site. In the subsurface, levels ranged from 17.6 mg/kg to 380 mg/kg with the highest level in SWSB-21-D, on the east side of the former smelter building.

Zinc concentrations exceeded the screening criterion in the majority of samples, with the highest levels in PASB-05, near the southeast corner of the former metal shear building, in both the surface (10,900J mg/kg) and the subsurface soil (33,300J mg/kg).

Cadmium exceedances of screening criterion ranged from 2 mg/kg to 96.5 mg/kg in surface soils, with the highest level in PASS-06, east of the former compactor/bailer building and near the northeast corner of the former smelter building. In subsurface soils, cadmium exceedances ranged from 3.3 mg/kg to 143J mg/kg, with the highest level in PASB-14 on the eastern side of the former compactor/bailer building.

Lead contamination exceeded the screening criterion in a majority of samples and is highest in the southern half of the site for both surface and subsurface soils. Isoconcentration contour maps for lead in the surface and subsurface soils, respectively, are shown in FIGURES 8 and 9. Surface soil concentrations ranged from 251 mg/kg to 15,900 mg/kg, with the highest concentration in SWSS-24, adjacent to the Hudson River, east of the former smelter building and staging area. Lead concentrations in subsurface soils ranged from 134 mg/kg to 9,970 mg/kg, with the highest levels on the southwest corner of the former smelter building (SWSB-20) and in the southeast corner of the site (SWSB-31), near the former tire piles.

Mercury exceedances in surface soils ranged from 0.8 mg/kg to 15.2 mg/kg with the highest levels in PASS-09, between and east of the former metal shear and compactor/ bailer buildings. Subsurface soil exceedances ranged from 0.23J mg/kg to 9.1 mg/kg.

Distribution of Indicator Contaminants in Soil: Indicator contaminants exceeded screening criteria in surface and subsurface soil samples in both process area and site-wide soil borings. In general, surface soils are contaminated with higher levels of indicator contaminants than subsurface soils. The PAH benzo(a)pyrene, which exceeded the screening criterion in the greatest number of samples, represents the general trend of PAH contamination in site soils. PAH contamination is generally highest in areas surrounding and east of the former metal shear building.

The highest concentrations of Aroclor-1254 were found in surface soils surrounding the former metal shear and compact/bailer buildings, as indicated in both screening-level and analytical samples.

The highest concentrations of the majority of inorganic indicator contaminants in laboratory samples occur in the process area around the former metal shear, compactor/bailer, and smelter buildings, in both surface and subsurface soils. The highest levels of lead in the surface soils are located just east of the former buildings in the process area and in the southwestern part of the site, and in subsurface soils at the former smelter/staging area and in the southwest corner of the site.

Utilizing the lead screening sample results, the extent of lead contamination was delineated in the unsaturated zone below 4 feet bgs. Lead levels in subsurface soils from 4-14 feet bgs exceeded screening criteria in many samples. The levels generally decreased with depth; lead levels exceeded criteria by the following factors 35 times (4-6 feet), 39 times (6-8 feet), 15 times (8-10 feet), 7 times (10-12 feet), and under 6 times (12-14 feet).

Sediment Samples

Ten sediment samples were collected in the Hudson River adjacent to the site. In addition, 10 background sediment samples were collected in the Hudson River north of the site, in areas expected to be outside the tidal distribution of potential contamination from the site. The sediment sample locations are shown on FIGURE 10. TABLE 3 shows all sediment screening criteria exceedances for the sediment samples.

Sediment Sample Indicator Contaminant Results

PAHs: The highest levels of PAH indicator contaminants were detected in SD-19, located offshore of the southern boundary of the site. Indeno(1,2,3-c,d)pyrene and dibenz(a,h)anthracene were detected at 7,700 ug/kg and 2,400J ug/kg, respectively; these levels exceed screening criteria. Benzo(a)anthracene (16,000 ug/kg), benzo(b)fluoranthene (15,000 ug/kg) and benzo(a)pyrene (12,000 ug/kg) also exceeded screening criteria, but were below background levels. PAH indicator contaminants exceeded screening criteria in the majority of the remaining adjacent sediment samples, but were significantly lower, with overall PAH levels ranging from non-detect to 3,900J (benzo(a)pyrene and benzo(a) anthracene in SD-20).

PCBs: Aroclor-1254 was not detected in any sediment samples. However, Aroclor-1248 exceeded screening criteria at four locations: SD-11 (520J ug/kg), SD-13 (220J ug/kg), SD-16 (260J and 290J ug/kg) and SD-18 (230J ug/kg).

Inorganics: Six inorganic indicator contaminants exceeded screening criteria and background levels in adjacent sediment samples: arsenic, cadmium, copper, iron, lead, and zinc. The highest levels were detected in SD-17, approximately due east of the former smelter/staging area and hydraulically downgradient of the former metal shear and compactor/bailer buildings. All six inorganic indicator contaminants exceeded background levels and screening criteria in this sample. Iron and zinc exceeded screening criteria in all sediment samples; iron ranged from 25,000 mg/kg to 69,000 mg/kg and zinc ranged from 160 mg/kg to 1,100 mg/kg. Copper and lead exceeded screening criteria and background levels in three samples, SD-11, SD-17 and SD-20, Cadmium exceeded screening criteria in two samples, at 1.4 mg/kg (SD-11) and 1.7 mg/kg (SD-17). Arsenic exceeded screening criteria in one sample, SD-17, at 14 mg/kg.

Distribution of Indicator Contaminants in Sediment: The majority of site-specific indicator contaminants exceeded screening criteria in sediment samples adjacent to the site. However, many of these exceedances were below the calculated background values. The highest levels of PAH indicator contaminants were found in SD-19, located offshore of the southern boundary of the site; two of these indicator contaminants were above background values. Since there are many sources of PAHs to the Hudson River, the origin of these contaminants is difficult to determine.

Approximately half of the inorganic indicator contaminants exceeded both screening criteria and background calculations. The highest levels of inorganic indicator contaminants are in samples offshore of the southern half of the site and in one sample just north of the site. The highest levels are concentrated in one sample (SD-17) located approximately due east of the former smelter/staging area and hydraulically downgradient (based on groundwater flow) of the former metal shear and compact/bailer buildings. SD-17 was collected approximately 125 feet from the river bank. Inorganic indicator contaminants are not considered to be naturally occurring, suggesting that either these contaminants migrated from other sources unrelated to the site or from sources at the site.

Surface Water Samples

Ten surface water samples were collected in the Hudson River and were co-located with the sediment samples (see FIGURE 10). Similar to the sediment samples, 10 background surface water samples were collected. TABLE 4 shows surface water screening criteria exceedances for the surface water samples.

Surface Water Sample Indicator Contaminant Results

Iron exceeded its screening criteria in all except one sample (SW-12), ranging from 360 micrograms per liter (ug/L, equivalent to ppb) to 740 ug/L. The highest iron concentration was in SW-15, east of the former compactor/bailer building. Lead exceeded screening criteria in SW-12 (12 ug/L) and SW-14 (10 ug/L), east of the northeastern corner of the site.

Distribution of Indicator Contaminants in Surface Water: Iron exceeded the calculated background level and screening criteria in nine of ten surface water samples adjacent to the site. Lead exceeded its screening criteria in two samples.

Groundwater Samples

Two rounds of groundwater samples were collected from each of the nine wells installed as part of the RI, to determine the nature and extent of groundwater contamination at the site. The VOCs detected in on-site wells are commonly found in gasoline, and are likely a result of leaking USTs or gasoline leaking from crushed vehicles. Monitoring well locations are shown on FIGURE 5; results of screening criteria exceedances are summarized on TABLE 5.

Groundwater Sample VOC and Indicator Contaminant Results

Round 1: VOCs were detected above screening criteria in five of the Round 1 groundwater samples. Methyl tert-butyl ether (MTBE) exceeded the screening criterion in MW-04 (14 ug/L), MW-05 (14 ug/L), MW-07 (19 ug/L), and MW-08 (15 ug/L). Other VOCs that exceeded screening criteria were benzene in MW-09 (9.6 ug/L), MW-04 (3.8 ug/L) and MW-05 (18 ug/L); toluene (9.8 ug/L) and ethylbenzene (62 ug/L) in MW-05; and m,p-xylenes in MW-04 (6.6 ug/L) and MW-05 (260 ug/L).

Iron exceeded its screening criterion in all nine monitoring wells, including the background well (MW-09). Iron levels in downgradient wells ranged from 4,500 ug/L to 70,000 ug/L. Lead exceeded its screening criterion in two wells, MW-03 (38 ug/L) and MW-05 (91 and 89 ug/L). Zinc exceeded its screening criterion in MW-05 (150 and 140 ug/L).

Round 2: VOCs were detected above screening criteria in six of the Round 2 groundwater samples. MTBE exceeded the screening criterion in MW-03 (16 ug/L), MW-04 (47J ug/L), MW-07 (26 ug/L), and MW-08 (14 ug/L). Other VOCs that exceeded screening criteria were benzene in MW-09 (13 ug/L), MW-04 (1.9J ug/L), and MW-05 (4.9 ug/L); ethylbenzene in MW-05 (19 ug/L); and m,p-xylenes in MW-05 (61 ug/L).

Iron and zinc exceeded screening criteria, but lead did not. Iron levels were similar to Round 1, but were higher; levels in downgradient wells ranged from 5,550 ug/L to 87,200 ug/L. Zinc exceeded its screening criterion in seven wells during Round 2 (compared to two wells during Round 1); results ranged from 25.6J ug/L to 105 ug/L.

Distribution of VOCs and Indicator Contaminants in Groundwater: VOCs and inorganic indicator contaminants exceeded screening criteria in groundwater in certain wells at the site. VOCs commonly found in gasoline (MTBE, benzene, ethylbenzene, and m,p-xylene) were detected above screening criteria in five or six wells during the two rounds of sampling. The majority of exceedances were downgradient (east) of former USTs located along the western border of the site. The highest levels of contaminants were adjacent to and downgradient of the former compactor/bailer and metal shear buildings. The highest concentrations were detected in MW-05, approximately 250 feet downgradient of the former metal shear building. Turbidity readings were relatively low during both rounds of groundwater sampling, and were not likely to affect inorganic results.

Fate and Transport Summary

As part of its studies, EPA evaluated the fate and transport of indicator contaminants at the site. Inorganics, PCBs, and PAHs, are relatively insoluble in water, and show high tendencies to adsorb to soil or organic matter in soil or sediment. Analytical results for the various media support this fate and transport scenario, since many of the contaminants detected in soils and sediment do not exceed screening criteria in surface water or groundwater. Additionally, VOCs are considered indicator contaminants in groundwater. However, the application of TAGM soil cleanup objectives to VOCs and PCBs[4] from a depth of six feet to the water table based on protection of groundwater will eliminate this migration pathway. This is discussed in more detail in subsequent sections of this ROD.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The site is located along the Hudson River waterfront, with a boat launch facility on the northern side, the City of Newburgh wastewater treatment plant on the southern side, and active railroad tracks on the western side, with a mix of industrial facilities and residential housing beyond the tracks. In recent years, new residential housing has been built in the Newburgh area along the Hudson River waterfront. The City of Newburgh is taking an active role in the revitalization of the Hudson River shoreline. The site is currently zoned for mixed use, including residential, recreational, and commercial uses; based on correspondence and discussions with the City of Newburgh, EPA's remedy would be consistent with the City's anticipated future use of the site, which includes commercial, recreational, and restricted residential development.

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[4] PCBs are generally low solubility compounds, but may migrate when dissolved in more mobile substances, including certain VOCs.

Ecology and Cultural Resources

Threatened, Endangered Species and Sensitive Environments

Two federally endangered and one threatened species are known to occur in the vicinity of the site. The Indiana bat (*Myotis sodalis*), an endangered species, is reported to occur at a hibernaculum, approximately 20.7 miles from the site. The bald eagle (*Haliaeetus leucocephalus*), a threatened species, is also reported to occur in the vicinity of the site. The shortnose sturgeon (*Acipenser brevirostrum*) is another endangered species located in the project area; this species utilizes the Hudson River adjacent to the site as a summer habitat.

The NYSDEC indicated the following species endangered and threatened under State law and are reported to occur within a four mile radius of the site:

- Endangered Species - Fish
  - Shortnose sturgeon (*Acipenser brevirostrum*)

- Endangered Species - Plants
  - American waterwort (*Elatine americana*)
  - Riverband quillwort (*Isoetes riparia*)
  - Seaside goldenrod (*Solidago sempervirens* var. Mexicana)
  - Slender marsh-pink (*Sabatia campanulata*)

- Endangered Species - Avian
  - Peregrine falcon (*Falco peregrinus*)

- Threatened Species - Plants
  - Smooth bur-marigold (*Bidens laevis*)
  - Heartleaf plantain (*Plantago cordata*)
  - Spongy arrowhead (*Sagittaria montevidensis* var. spongiosa)
  - Woodland agrimony (*Agrimonia rostellata*)

- Threatened Species - Avian
  - Bald eagle (*Haliaeetus leucocephalus*)
  - Least bittern (*Ixobrychus exilis*)
  - Upland sandpiper (*Bartramia longicauda*)

- Rare Species - Plant
  - Estuary beggar-ticks (*Bidens bidentoides*)

None of these species were observed during the ecological reconnaissance at the site. No wetlands or sensitive habitats were observed at or adjacent to the site.

A Stage IA cultural resources survey was conducted for the site. The survey indicated that the site was the former location of a shipyard which operated between the 1880s and the post-World War II era. It is likely the construction and expansion of the shipyard would have destroyed any earlier prehistoric remains at the site. Since the site has been cleared in recent years after the closure of the scrap yard, it is doubtful that any intact resources remain from the historic shipyard operations.

SUMMARY OF SITE RISKS

A baseline Human Health Risk Assessment (HHRA) and a Screening Level Ecological Risk Assessment (SLERA) were conducted by EPA to provide a quantitative assessment of the health risks to human receptors and a qualitative assessment of risk to ecological receptors under current and future land-use scenarios if no remedial action were taken at the site.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification* - identifies the contaminants of potential concern (COPCs) at the sites based on several factors such as toxicity, frequency of occurrence and concentration. *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water by which humans are potentially exposed). *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The reasonable maximum exposure was evaluated.

Hazard Identification

EPA conducted a baseline HHRA to evaluate the potential risks and hazards to human health associated with the site in its current state. Although the risk assessment evaluated all contaminants identified in the groundwater, soils, sediment, and surface water, the conclusions of the risk assessment indicate that the significant risks and hazards are associated with PAHs, PCBs, and lead in the soil at the site, primarily from direct contact by potential future site workers, construction workers, and residents. This section of the decision summary will focus on the risks associated with these contaminants. A summary of the concentrations of the contaminants of concern for the site is provided in TABLE 6.

Exposure Assessment

EPA's risk assessment addressed the potential risks to human health by identifying several potential exposure pathways by which the public may be exposed to contaminant releases at the site under current and future land use and groundwater use conditions. Although the onsite groundwater is not currently used for drinking, it is designated by the State as a potable water supply, meaning it could be available for drinking in the future. The site is currently zoned for mixed use, including residential, recreational, and commercial uses; based on correspondence and discussions with the City of Newburgh, EPA's remedy would be consistent with the City's anticipated future use of the site, which includes commercial, recreational, and restricted residential development. In the HHRA, contaminants in soil, sediment, groundwater, and air at the site were quantitatively evaluated for potential health threats to current and future onsite receptors. Contaminants in surface water did not exceed their conservative health-based screening values and were therefore not quantitatively evaluated.

The baseline risk assessment focused on a variety of possible receptors, including current and future trespassers, as well as recreational users of the river (adolescent and adult) and of the site itself (child and adult). However, consistent with the anticipated future use of the site, the receptors most likely to be in contact with contaminated media (soil and groundwater) were primarily considered when weighing possible remedies for the site. These include the future on-site worker, resident (child and adult), and construction worker.

TABLE 7 presents all exposure pathways considered in the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are also included.

Toxicity Assessment

Under current EPA guidelines, the likelihood of carcinogenic (cancer-causing) and noncarcinogenic (systemic) effects due to exposure to site chemicals are considered separately. Consistent with EPA guidance, it was assumed that the toxic effects of the site-related chemicals would be additive. Thus, carcinogenic and noncarcinogenic risks associated with exposures to individual contaminants of concern were summed to indicate the potential risks associated with mixtures.

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intake and safe levels of intake (reference doses and inhalation reference doses). Reference doses (RfDs) and inhalation reference doses (RfDis) have been developed by EPA for indicating the potential for adverse health effects. RfDs and RfDis, which are expressed in units of milligrams per kilogram per day (mg/kg-day), are estimates of daily exposure levels for humans thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical vapor inhaled) are compared with the RfD or RfDi to derive the hazard quotient for the contaminant in the particular medium. The HI is derived by adding the hazard quotients for all compounds within a particular medium that impact a particular receptor population.

An HI greater than 1 indicates that the potential exists for noncarcinogenic health effects to occur because of Site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. The toxicity values, including reference doses and inhalation reference doses for the contaminants of potential concern at the Site, are presented in TABLE 8.

Potential carcinogenic risks were evaluated using the cancer slope factors developed by EPA for the contaminants of potential concern. Cancer slope factors (SFs) and inhalation cancer slope factors (SFis) have been developed for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs and SFis, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF or SFi. Use of this approach makes the underestimation of the risk highly unlikely. The SF and SFi values used in this risk assessment are presented in TABLE 9.

Risk Characterization

The quantitative hazard and risk calculations were based on reasonable maximum exposure scenarios. These estimates were developed by taking into account various conservative assumptions about the likelihood of a person being exposed to contaminated media at the site. Risk characterization involved integrating the exposure and toxicity assessments into quantitative expressions of carcinogenic risks and noncarcinogenic health effects. Specifically, chronic daily intakes were compared with concentrations known or suspected to present carcinogenic risks or noncarcinogenic health hazards.

For known or suspected carcinogens, EPA considers excess upper-bound individual lifetime cancer risks of between 10^{-4} to 10^{-6} to be acceptable. This range indicates that an individual has no more than approximately a one in ten thousand to one in one million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year period under specific exposure conditions at a site. Excess lifetime cancer risks estimated at the site are presented in TABLE 10. The noncarcinogenic HIs are presented in TABLE 11.

Lead was not quantitatively evaluated for the potential receptors at the site due to lack of toxicity values for this compound. It is, nonetheless, a chemical of concern for the site due to its widespread presence in the surface soil, with a mean concentration of 3,180 ppm. This value exceeds both the EPA health-based screening level of 400 ppm for children and 800 ppm for adults. Therefore, exposure to site soils by these receptors may result in adverse health effects. The maximum concentration of lead in groundwater (90 ug/L) also exceeds the federal maximum contaminant level (MCL) of 15 ug/L for drinking water.

At the site, the quantitative excess lifetime cancer risk and noncarcinogenic HIs are as follows:

Future Site Workers: Risks and hazards were evaluated for incidental ingestion of, dermal contact with, and inhalation of particulates released from surface soil; inhalation of VOCs in indoor air from vapor intrusion from subsurface groundwater, and ingestion of tap water. The total incremental lifetime cancer risk estimated is 2 x 10^{-4}. The calculated HI is 8.

Future Construction Workers: Risks and hazards were evaluated for incidental ingestion of, dermal contact with, and inhalation of particulates released from surface and subsurface soil. The total incremental lifetime cancer risk estimate is 8 × 10^{-6}. The calculated HI is 9.

Future Residents: Risks and hazards were evaluated for incidental ingestion of, dermal contact with, and inhalation of particulates released from surface soil; inhalation of VOCs in indoor air from vapor intrusion from subsurface groundwater; and ingestion of and dermal contact with tap water. The total incremental lifetime cancer risk estimates are 2 × 10^{-4} (adult) and 4 × 10^{-4} (child). The calculated HIs are 14 (adult) and 73 (child).

For these receptors, exposure to surface soil results in either an excess lifetime cancer risk that exceeds EPA's target risk range of 10^{-4} to 10^{-6} or an HI above the acceptable level of 1, or both, indicating that there is significant potential risk to populations from direct exposure to soil. The chemicals in soil that contribute most significantly to the cancer risk and non-cancer hazard are PCBs and PAHs. Additionally, the average concentration of lead in soil exceeds the health-based screening value for both the adult and the child, indicating the potential for adverse health effects. Risks from only the ingestion of groundwater pathway are within the acceptable range. However, benzene in groundwater exceeds the New York State MCL of 1 ug/L and lead exceeds the federal action level of 15 ug/L. The maximum concentration of benzene (17 ug/L) in groundwater also exceeds the conservative health-based vapor intrusion screening value of 1.4 ug/L found in the 2002 EPA *Draft Guidance for Evaluation the Vapor Intrusion to Indoor Air Pathway from Groundwater to Soil.* This suggests that there is the potential for vapor intrusion into buildings that may be constructed on-site in the future. Risks and hazards from surface water and sediment in the Hudson River did not exceed EPA's thresholds.

Discussion of Uncertainties in Risk Assessment

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources, including the errors inherent in the analytical methods and characteristics of the matrix being sampled. During the RI, no soil samples below four feet were analyzed by a laboratory. This presents some uncertainty in the subsurface soils. Evaluations below four feet were based on screening-level data.

Fate and transport modeling is also associated with a certain level of uncertainty. Factors such as the concentrations in the primary medium, rates of transport, ease of transport, and environmental fate all contribute to the inherent uncertainty in fate and transport modeling.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, and from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the site, and is highly unlikely to underestimate actual risks related to the site.

More specific information concerning public health and environmental risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the risk assessment report.

Ecological Risk Assessment

A screening level ecological risk assessment (SLERA) was conducted to assess the potential for risk to ecological receptors due to site-related contamination. The SLERA includes the first two steps of EPA's process for conducting ecological risk assessments at Superfund sites. For ecological risks, hazard quotients (HQs) are developed to evaluate potential adverse effects to ecological receptors. HQs greater than 1 generally indicate a potential for adverse effects. The SLERA conducted for the site indicated a potential for ecological risk. Site surface soils had HQs greater than 1 for PAHs, pesticides, and inorganics in the former process area and for VOCs, PAHs, pesticides, and inorganics in the site-wide soils. HQs greater than 1 were calculated for aluminum, iron, and lead in surface water; however, none of these inorganics are considered to be a major source of site-related risk to ecological receptors. Sediments exhibited HQs greater than 1 for PAHs and inorganics.

The SLERA was conducted using the maximum detected concentrations of contaminants compared with the most conservatively derived benchmarks in order to establish whether the potential for risk to ecological receptors exists. Because a potential risk was established in the SLERA, a more thorough assessment was conducted based on more information, providing refinement to the evaluation criteria. For this evaluation of risk to ecological receptors from sediment at this site, the refinements included: refinement of exposure point concentrations; normalization of sediment screening values using average site-specific total organic carbon concentrations; consideration of background concentrations; consideration of site-related contaminants; and more appropriate screening benchmarks. These refinements, shown on TABLE 12, resulted in the following conclusions:

- The individual concentrations of most of the contaminants are below the refined screening values, resulting in HQs below 1, and indicating no risk to ecological receptors;

- Several of the contaminants with HQs greater than 1 (acetone, acenaphthylene, 4-methylphenol) or lacking screening values (benzaldehyde, carbazole, endrin ketone, thallium) are not considered to be site-related contaminants;

- The concentrations of several contaminants minimally exceeded screening values (butylbenzylphthalate, aluminum, manganese, copper, selenium, silver, zinc), generating HQs in the range of 1 to 4, indicating a very low potential for risk; and

- The mean concentration of benzo(b)fluoranthene exceeded the refined screening criteria, resulting in an HQ of 8.0; however, concentrations of this compound are similar to background concentrations, as the mean background sediment concentrations for benzo(b)fluoranthene resulted in an HQ of 5.3.

Based on these conclusions, remediation of the sediments in the Hudson River adjacent to the site is not warranted.

Basis for Action

Based upon the results of the RI and human health and ecological risk assessments, EPA has determined that the response action selected in this ROD is necessary to protect the public health or welfare of the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

The remedial action objectives (RAOs) are media-specific goals to protect human health and the environment. The RAOs are identified following the identification of COPCs, identification of potential federal and state ARARs and other guidances to be considered (TBCs), development of site-specific risk-based cleanup levels, and, finally, selection of the PRGs based on the ARARs, guidance values, or risk-based values. There are currently no federal or New York State promulgated standards for contaminant levels in soils. There are, however, other federal or state advisories, criteria, or guidance (i.e., TBCs), one of which is the NYS TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, No. 94-HWR-4046, January 24, 1994. The soil cleanup objectives identified in NYSDEC's TAGM are either a human health protection value or a value based on protection of groundwater (calculating the concentration in soil which would theoretically produce contaminant concentrations in the groundwater which would meet groundwater standards), whichever is more stringent. EPA has reviewed the TAGM model's formula and assumptions and has determined that the TAGM objectives for VOCs will be protective of human health and the groundwater.

TAGM objectives, along with other PRGs used for site soils, can be found in TABLES 13 and 14.

The following RAOs were established for each media at the site:

Soils

- Prevent or minimize exposure to human and ecological receptors through ingestion and inhalation of or dermal contact with contaminated soils; and
- minimize or eliminate contaminant migration from site soils to groundwater and surface water.

Groundwater

Due to the limited risks and exposure to the groundwater at this site, institutional controls are deemed adequate to address any potential future exposure. Specifically, deed restrictions will be imposed to prevent the use of groundwater as a source of potable or process water unless groundwater quality standards are met. Long-term monitoring will be conducted to ensure that the selected site remedy is protective of human health and the environment. The groundwater will be monitored as part of the response action to ensure that, following the soil excavation, the contamination is attenuating and groundwater quality continues to improve. As a result, no RAO is established for groundwater.

Surface Water

Results from the RI indicate that contamination at the site has not significantly impacted the surface water of the adjacent Hudson River. The site-specific HHRA and SLERA indicate the surface water does not contribute to the site-specific risks or hazards. As a result, no RAO is established for surface water.

Sediment

Results from the RI indicate that contamination at the site has not significantly impacted the sediment above background levels. The site-specific HHRA and SLERA indicate that sediment poses very low risks to human health and ecological receptors. As a result, no RAO is established for sediment.

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected remedy be protective of human health and the environment, be cost-effective, comply with ARARs, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

Detailed descriptions of the remedial alternatives for meeting the site RAOs can be found in the FS Report. The alternatives include a no action alternative and three action alternatives. These alternatives are presented below.

The implementation time for each alternative reflects only the time required to construct or implement the remedy and not the time required to negotiate with potentially responsible parties, design the remedy, or procure contracts for design and construction.

Alternative 1 - No Action

Capital Cost:	$ 0
Annual Operation and Maintenance (O&M):	$ 0
Present Worth:	$ 0
Time to Implement:	0 months

The Superfund Program requires that the "no-action" alternative be considered as a baseline for comparison with other alternatives. Under this alternative, no further action would be implemented, and the current status of the site would remain unchanged. Institutional controls would not be implemented to restrict future site development or use. Engineering controls would not be implemented to prevent site access or exposure to site contaminants. The existing security fence would remain in its current status, but would not be monitored or maintained.

Because this alternative would result in contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Alternative 2 - Debris Removal, Capping of Site Soils, and Institutional Controls

Capital Cost:	$2.8 M
Annual Operation and Maintenance (O&M):	$771,000
Present Worth:	$3.6 M
Time to Implement:	12 months

Alternative 2 consists of the following components:

- Removal of surface debris and building materials,
- On-site debris and building material decontamination contingent on characterization,
- Disposal of debris and building materials off-site in accordance with regulatory requirements,
- Placement of a non-RCRA cap over the site (soil cap assumed for cost estimation purposes),
- Institutional controls to govern future site use, cap disturbance, and groundwater use, and
- Long-term monitoring of the soil cap and groundwater to assess remedy effectiveness.

Debris and Building Removal. Surface debris and above-ground building materials would be collected and stockpiled on-site. Surface debris to be collected consists mainly of scrap metal, tires, and small car parts, but also includes some miscellaneous trash and debris. It is estimated that the top six inches of the site surface is comprised primarily of debris. Demolition would be required for the former garage at the north end of the site. Foundations and concrete pads remaining from the former garage, office building, loading dock, metal shear building, compactor/bailer building, smelter, and staging area would only be removed if necessary for the installation of the non-RCRA cap. For cost estimation purposes, this remedy includes demolition of the former garage, but it is assumed that building foundations and concrete pads would remain in place.

Decontamination. The building materials and debris may have varying degrees of contamination. Representative pieces of material would be sampled using a surficial wipe test, and analytical results would be used to develop appropriate work procedures and characterization programs. Should it be necessary, decontamination procedures would be implemented to remove surficial contamination.

Disposal. Building materials and debris would be disposed of off-site in accordance with applicable regulatory requirements. For cost estimating purposes, it is assumed that building materials and debris will be non-hazardous following decontamination, and they would be disposed of at the nearest RCRA Subtitle D landfill.

Non-RCRA Cap. Following building material and debris disposal, a non-RCRA cap would be placed over the entire site. A 2-foot thick clean soil cap is assumed for cost estimation purposes. The clean soil cap would consist of common fill, graded and compacted to allow for proper site drainage, with six inches of topsoil and a vegetative layer at the surface. The cap would isolate contaminated material, thus limiting human exposure to contaminated soil and dust and reducing contaminant migration through dispersion and erosion. To protect the clean soil layer from erosion during possible future flooding, a layer of geocell webbing[5] would be placed beneath the clean topsoil layer within the 100-year flood zone. Riprap would be placed along the Hudson River shoreline.

Institutional Controls. After completion of the construction, institutional controls prohibiting disturbance of the cap would be utilized to protect the integrity of the cap and to prevent exposure to impacted soil and groundwater. Future intrusive activities and use of groundwater as potable water or for irrigation would be prohibited through an environmental easement/restrictive covenant. Future use of the property would be restricted to protect the cap's integrity.

Long-term Monitoring. Because contamination would remain on-site following implementation of this remedial alternative, long-term monitoring of site conditions would be necessary to ensure that the remedy remains protective of human health and the environment. The alternative would include 30 years of annual groundwater sampling and verification of cap integrity. It is assumed that the nine existing monitoring wells would be used for the long-term groundwater monitoring program. An additional well would be installed at the MW-1 location, with the screen correctly placed

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5 The purpose of the use of this material is to reduce the potential for erosion of the soil cover and is not intended to function as a demarcation layer described elsewhere in this document.

within the aquifer to monitor the identified groundwater contamination[6].

Alternative 3 - Debris Removal, Excavation of Site Soils, Off-site Disposal, Backfill with Clean Soil, and Institutional Controls

Capital Cost:	$26.4 M
Annual Operation and Maintenance (O&M):	$362,000
Present Worth:	$26.8 M
Time to Implement:	18 months

Alternative 3 consists of the following components:

- Performance of a pre-design investigation,
- Removal of surface debris and building materials,
- Excavation to the water table of soil exceeding PRGs,
- Removal of foundations and below-ground building materials,
- On-site debris and building material decontamination contingent on characterization,
- Disposal of debris, building materials, and excavated soil off-site in accordance with regulatory requirements,
- Backfilling of excavated areas with clean fill,
- Institutional controls to prevent exposure to groundwater, and
- Long-term monitoring of the groundwater.

Pre-design Investigation. A pre-design investigation would be performed to collect subsurface soil samples below four feet, for laboratory analysis of all contaminants of concern, to refine the vertical extent of the soil excavation. Soil samples would also be collected at the peripheral areas of the site and analyzed for all contaminants of concern to determine if there is a need to extend the limits of the soil excavation beyond the property boundary. Representative soil samples collected throughout the depth profile would be analyzed for TCLP[7] to provide a more accurate determination of the quantity of hazardous versus non-hazardous soil. Geoprobe samples would be taken in localized areas of the site for VOC and PCB analysis to evaluate the need for source removal of soils at

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6 The screen at monitoring well MW-1 was improperly installed during well development.

7 TCLP, or toxicity characteristic leaching procedure, is a test performed on soil samples to determine whether they are classified as hazardous or non-hazardous waste, which affects their disposal.

depth. Results from this localized groundwater pre-design investigation, would be utilized to determine if a vapor intrusion investigation would also be required. The installation of a shallow monitoring well in the vicinity of MW-1 that is screened to monitor identified contamination would be done as part of the pre-design activities.

Debris and Building Removal. All surface debris and building materials, primarily consisting of concrete and metal, would be collected and stockpiled on-site. Surface debris to be collected consists mainly of scrap metal, tires, and small car parts, but also includes some miscellaneous trash and debris. It is estimated that the top six inches of the site surface is comprised primarily of debris. Demolition would be required for the former garage at the north end of the site.

Excavation. Contaminated soils would be excavated using standard construction equipment and stockpiled. The excavation of contaminated soils exceeding PRGs would extend to the water table.

Stormwater runoff would be controlled at excavation areas during excavation by installing conventional, temporary storm water/erosion control features, such as berms, ditches, rock-lined check dams, erosion control blankets, and silt fencing to divert storm water run off away from excavation areas, minimize storm water runoff from excavation areas, and prevent erosion and transport of contaminated soils to downgradient areas. Dust would be controlled through the use of water or commercial dust suppressants.

In order to estimate costs, the soils to be remediated were determined based on existing analytical and screening data for lead. The site-wide analytical data were used to characterize the soils in the 0-4 feet bgs interval. Because there are no laboratory analytical data for depths below 4 feet bgs, the lead field-screening data were used to classify soils below 4 feet bgs. Due to a low sample recovery rate for lead screening data below 10 feet bgs, the 4-10 foot interval was used for cost estimating purposes. The highest field screening reading between 4 and 10 feet bgs was assumed to be representative of that interval in each soil boring. The pre-design investigation would be used to more precisely determine excavation volumes and locations, particularly within the 4-10 foot depth interval.

The residential lead PRG of 400 mg/kg was used to map the excavation areas. A summary of volumes to be excavated is presented in TABLE

15. It is estimated that 107,000 cubic yards of soil would be removed and replaced under this alternative.

Foundation Removal. During excavation, the foundations, basements, and concrete pads remaining from the former garage, office building, loading dock, metal shear building, compactor/bailer building, smelter, and staging area would be demolished and stockpiled for off-site disposal following characterization and decontamination. The soils below the metal shear building foundation would also be evaluated for the presence of LNAPL[8].

Decontamination. The building materials and debris may have varying degrees of contamination. Representative pieces of material would be sampled using a surficial wipe test, and analytical results would be used to develop appropriate work procedures and characterization programs. Should it be necessary and cost effective, decontamination procedures would be implemented to remove surficial contamination.

Disposal. Building materials, debris, and excavated materials would be disposed of off-site in accordance with applicable regulatory requirements. Excavated materials that are classified as hazardous waste would be disposed of at a RCRA Subtitle C hazardous waste landfill. Materials that are determined to be non-RCRA hazardous would be disposed of at a RCRA Subtitle D non-hazardous waste landfill.

For cost estimating purposes, it is assumed that building materials and debris will be non-hazardous following decontamination, and they would be disposed of at a Subtitle D landfill. It is also assumed that 50% of excavated soils would be classified as hazardous and disposed of at a Subtitle C landfill and 50% would be classified as non-hazardous, to be disposed of in a Subtitle D landfill.

Backfill. The excavation would be backfilled with common fill meeting the PRG values. The backfilled excavation area would be graded and compacted to allow for proper site drainage, with a vegetative layer at the surface. The clean backfill material would

[8] The metal shear building basement required the pumping and removal of 28,000 gallons of hydraulic oil during the site clearing operation; the evaluation for the presence of LNAPL, or light non-aqueous phase liquid, will indicate whether any of this oil migrated into the site soils.

function to isolate any remaining contaminated material, thus limiting human exposure to contamination and reducing contaminant migration through dispersion and erosion.

Institutional Controls. Only minimal institutional controls for future site development would be necessary with this alternative. An environmental easement/restrictive covenant would restrict the use of groundwater as potable water and for irrigation unless groundwater quality standards are met.

Long-term Groundwater Monitoring. Groundwater contamination that will remain on-site following implementation of this remedial alternative, would be monitored. This alternative includes 30 years of annual groundwater sampling to ensure that, following the soil excavation, the contamination is attenuating and groundwater quality continues to improve. An additional well would be installed at the MW-1 location, with the screen correctly placed within the aquifer to monitor the identified groundwater contamination.

Alternative 4 - Debris Removal, Partial Excavation of Site Soils, Off-site Disposal, Backfill with Clean Soils, Institutional Controls, and Site Management Plan

Capital Cost:	$19.8 M
Annual Operation and Maintenance (O&M):	$376,000
Present Worth:	$20.1 M
Time to Implement:	18 months

Alternative 4 consists of the following components:

- Performance of a pre-design investigation,
- Removal of surface debris and building materials,
- Excavation of soil exceeding the residential lead PRG down to six feet,
- Excavation of soil below six feet to the water table which exceeds the PCB and VOC PRGs for protection of groundwater,
- Removal of foundations and below-ground building materials,
- On-site debris and building material decontamination contingent on characterization,
- Disposal of debris, building materials, and excavated soil off-site in accordance with regulatory requirements,
- Backfilling of excavated areas with clean fill,
- Institutional controls and a SMP to limit future land and groundwater use, and
- Long-term monitoring of the groundwater.

Pre-design Investigation. A pre-design investigation would be performed to collect subsurface soil samples below four feet, for laboratory analysis of all contaminants of concern, to refine the vertical extent of the soil excavation. Soil samples would also be collected at the peripheral areas of the site and analyzed for all contaminants of concern to determine if there is a need to extend the limits of the soil excavation beyond the property boundary. Representative soil samples collected throughout the depth profile would be analyzed for TCLP to provide a more accurate determination of the quantity of hazardous versus non-hazardous soil. Geoprobe samples would be taken in localized areas of the site for VOC and PCB analysis to evaluate the need for source removal of soils at depth. Results from this localized groundwater pre-design investigation would be utilized to determine if a vapor intrusion investigation would also be required. The installation of a shallow monitoring well in the vicinity of MW-1 that is screened to monitor identified contamination would be done as part of the pre-design activities.

Debris and Building Removal. All surface debris and building materials, primarily consisting of concrete and metal, would be collected and stockpiled on-site. Surface debris to be collected consists mainly of scrap metal, tires, and small car parts, but also includes some miscellaneous trash and debris. It is estimated that the top six inches of the site surface is comprised primarily of debris. Demolition would be required for the former garage at the north end of the site.

Excavation. Contaminated soils would be excavated using standard construction equipment and stockpiled. Contaminated soils exceeding the residential lead PRG would be excavated down to a depth of six feet bgs. Contaminated soils that exceed the VOC and PCB PRGs for the protection of groundwater would be excavated below six feet to the water table if determined to be necessary by the pre-design investigation sampling. A demarcation layer, identified by the placement, prior to backfilling, of a readily-visible and permeable subsurface demarcation at the interface between the backfilled clean fill and soils left in place, will be employed at the site.

Six feet was chosen as an appropriate depth of excavation based on the reasonably anticipated future land use of the site. The site is currently zoned for mixed use, including residential, recreational, and commercial uses; based on correspondence and discussions with the City of Newburgh, EPA's remedy would be consistent with the City's anticipated future use of the site, which includes commercial, recreational, and restricted residential development. The six foot clean zone provided by this alternative takes into consideration common architectural and building practices.

Stormwater runoff would be controlled at excavation areas during remedial construction by installing conventional, temporary storm water/erosion control features, such as berms, ditches, rock-lined check dams, erosion control blankets, and silt fencing to divert storm water run off away from excavation areas, minimize storm water runoff from excavation areas, and prevent erosion and transport of contaminated soils to downgradient areas. Dust would be controlled through the use of water or commercial dust suppressants.

In order to estimate costs, the soils to be remediated were determined based on existing analytical sampling and screening data for lead, PCBs, and VOCs. The site-wide analytical data were used to characterize the soils in the 0-4 foot bgs interval. Because there are no laboratory analytical data for depths below four feet bgs, the field screening data were used to classify soils below four feet bgs. The pre-design investigation would be used to more precisely determine excavation volumes and locations.

The residential lead PRG of 400 mg/kg was used to map the excavation area for the 0-6 foot bgs interval. The PCB and VOC PRGs for protection of groundwater of 10 mg/kg were used to map the excavation area below six feet to the water table. However, the screening data do not indicate the presence of VOC- and PCB-contaminated soils above the PRG within this depth increment. The pre-design investigation would be used to determine if excavation below six feet is necessary and, if so, to more precisely determine excavation volumes and locations. The proposed excavation depths are shown on FIGURE 11. A summary of volumes to be excavated is presented in TABLE 15. It is estimated that 78,000 cubic yards of soil would be removed and replaced under this alternative.

Foundation Removal. During excavation, the foundations, basements, and concrete pads remaining from the former garage, office building, loading dock, metal shear building, compactor/bailer building, smelter, and staging area would be demolished and stockpiled for off-site disposal following characterization and decontamination. The soils below the metal shear building foundation would also be evaluated for the presence of LNAPL.

Decontamination. The building materials and debris may have varying degrees of contamination. Representative pieces of material would be sampled using a surficial wipe test, and analytical results would be used to develop appropriate work procedures and characterization programs. Should it be necessary and cost effective, decontamination procedures would be implemented to remove surficial contamination.

Disposal. Building materials, debris, and excavated materials would be disposed of off-site in accordance with applicable regulatory requirements. Excavated materials that are classified as hazardous waste would be disposed of at a RCRA Subtitle C hazardous waste landfill. Materials that are determined to be non-RCRA hazardous would be disposed of at a RCRA Subtitle D non-hazardous waste landfill.

For cost estimating purposes, it is assumed that building materials and debris will be non-hazardous following decontamination, and they would be disposed of at the nearest Subtitle D landfill. It is also assumed that 50% of excavated soils would be classified as hazardous and disposed of at a Subtitle C landfill and 50% would be classified as non-hazardous, to be disposed of in a Subtitle D landfill.

Backfill. The excavation would be backfilled with common fill meeting PRG values. The backfilled excavation area would be graded and compacted to allow for proper site drainage, with a vegetative layer at the surface. The clean backfill material would function to isolate any remaining contaminated material, thus limiting human exposure to contamination and reducing contaminant migration through dispersion and erosion.

Institutional Controls. Institutional controls to limit land and resource use would be necessary with this alternative. The environmental easement/restrictive covenant will at a minimum require: (a) restricting any excavation below the soil cover's demarcation layer at six feet bgs unless the excavation activities are in compliance with an EPA-approved site management plan (SMP); (b) restricting new construction at the site unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in compliance with an EPA-approved SMP; and (c) restricting the use of groundwater as a source of potable or process water unless groundwater quality standards are met.

Site Management Plan. A SMP will be developed to address soils below six feet bgs that are left in place. These soils are primarily impacted by lead, which, based on sampling and analysis of site groundwater, is not mobile. The SMP will include guidelines to be followed during any excavations below the soil cover's demarcation layer. Excavated soils below the demarcation layer would need to be tested and properly handled to protect the health and safety of workers and the nearby community. In addition, the SMP will provide for the proper management of all site remedy components post-construction, such as institutional controls, and will also include: (a) monitoring of site groundwater to ensure that, following the soil excavation, the contamination is attenuating and groundwater quality continues to improve; (b) an inventory of any use restrictions on the site; (c) necessary provisions for ensuring the easement/covenant remains in place and is effective; (d) provision for any operation and maintenance required of the components of the remedy, and (e) the requirement that the owner or person implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

Long-term Groundwater Monitoring. Groundwater and subsurface soil contamination will remain on-site following implementation of this remedial alternative. Therefore, annual groundwater sampling would be necessary to ensure that, following the soil excavation, the contamination is attenuating and groundwater quality continues to improve. An additional well would be installed at the MW-1 location, with the screen correctly placed within the aquifer to monitor the identified groundwater contamination.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA Section 121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 C.F.R. §300.430(e)(9), and OSWER Directive 9355.3-01 (*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA: Interim Final*, October 1988). The detailed analysis consisted of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following "threshold" criteria are the most important and must be satisfied by any alternative in order to be eligible for selection:

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and regulations or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance are TBCs. TBCs are not required by the NCP, but the NCP recognizes that they may be very useful in determining what is protective of a site or how to carry out certain actions or requirements.

The following "primary balancing" criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. *Long-Term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume through treatment* is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. *Cost* includes estimated capital, O&M, and present worth costs.

The following "modifying" criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was presented in the Proposed Plan:

8. *State acceptance* indicates whether, based on its review of the RI/FS report, Human Health and Ecological Risk Assessment, and Proposed Plan, the State concurs with, opposes, or has no comments on the selected remedy.

9. *Community acceptance* refers to the public's general response to the alternatives described in the RI/FS report, Human Health and Ecological Risk Assessment, and Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria noted above, follows.

Overall Protection of Human Health and the Environment

Lead- and PCB-contaminated soil is prevalent at the site. Alternative 1 provides no protection of human health or the environment, as nothing would be done to address the contamination. Alternative 2 provides minimal protection to human health and the environment by limiting direct exposure to the contaminated soil; however, in the event that the clean soil cap is compromised, the alternative would cease to be protective. Further, groundwater quality would not be expected to improve under Alternative 2. Alternative 4 would eliminate current and future exposure to contaminated soil likely encountered based on reasonably anticipated future land use and would provide a site management plan to protect human health and the environment for impacted soils left in place. Groundwater quality would eventually be restored under Alternative 4 because of the removal of mobile contamination from site soils. Alternative 3 is the most protective because it would eliminate current and future exposure to contaminated soil by removing all contaminated soil to the water table from the site, which would also eventually restore groundwater quality.

Compliance with ARARs

There are currently no federal or New York State promulgated standards for contaminant levels in soils. There are, however, other federal or state advisories, criteria, or guidance (i.e., TBCs), one of which is the NYS TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, No. 94-HWR-4046, January 24, 1994. The soil cleanup objectives identified in NYSDEC's TAGM are either a human health protection value or a value based on protection of groundwater (calculating the concentration in soil which would theoretically produce contaminant concentrations in the groundwater which would meet groundwater standards), whichever is more stringent. EPA has reviewed the TAGM model's formula and assumptions and has determined that the TAGM objectives for VOCs will be protective of human health and the groundwater. The NYSDEC recommended soil cleanup objectives, and site-specific human health risk assessment based cleanup criteria were used to develop the PRGs. Alternative 1 would not achieve the PRGs, since no action would be taken. Alternative 2 would achieve PRGs for exposure at the surface, but contaminated subsurface soil would be left on-site and untreated. Alternative 3 has the highest probability of achieving the PRGs, since soil known to be contaminated with concentrations exceeding the PRGs would be permanently removed from the site. Alternative 4 would achieve all PRGs from the surface to six feet bgs and PRGs for the protection of groundwater site-wide. Although some soils exceeding the PRGs would be left in-place at depth, the contamination is not considered to be mobile and those soils are unlikely to be accessed through reasonably anticipated future land use. Should that occur, a SMP would be employed to ensure compliance with chemical-specific ARARs.

Alternatives 2, 3, and 4 would comply with location- and action-specific ARARs.

Long-Term Effectiveness and Permanence

Alternative 1 would not reduce risk in the long term, since the contaminants would not be controlled, treated, or removed. Alternatives 2 and 4 would both have residual risk due to contamination remaining on-site, but Alternative 4 would remove the principal threat from the site and risks from the residual soil would need to be controlled through institutional controls and a SMP. Alternative 3 would have the least amount of residual risk, since all contaminated soil above the water table would be excavated and disposed of off-site. Alternative 2 would require some level of operation and maintenance during the lifetime of the cap.

Alternative 1 would provide no engineering or institutional controls for remaining risk at the site. Alternatives 2 relies on institutional and engineering controls to prevent disturbances of the clean soil cap. In the event that the institutional controls are not enforced or engineering controls fail, exposure to contaminated media could occur. Alternative 4 is more reliable than Alternative 2 because the institutional controls would be applied to soils not expected to become exposed based on a reasonably anticipated future land use. Alternative 3 would include institutional controls that mandate no on-site activities below the water table. Since the site-use limitations associated with Alternative 3 are the least restrictive, they could be more easily enforced, and would be the most adequate and reliable in the long term.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 1 and 2 would not provide reductions in toxicity, mobility, or volume (TMV) through treatment; however, Alternative 2 would provide some reduction in contaminant mobility by limiting contaminant migration due to erosion and fugitive dust. Alternative 3 would not provide any reductions in TMV directly through treatment, but it would provide a near-total reduction in the volume of contaminated media by removing contaminated soil from the site. Alternative 4, like Alternative 2, would provide a reduction in contaminant mobility by limiting contaminant migration due to erosion and fugitive dust and like Alternative 3, would provide a reduction in the volume of contaminated media through its removal from the site. Treatment, however, is not a component of any of the alternatives because the heterogeneity of the site contaminants are not conducive to a single treatment technology.

Short-Term Effectiveness

Alternative 1 would achieve the highest degree of short-term effectiveness because no further action would be taken at the site and construction workers would not be subjected to any potential risks. Alternative 3 would have the lowest degree of short-term effectiveness since the excavated materials would require off-site transportation to disposal facilities, increasing the potential for accidents and releases to occur during shipment, as well as potential traffic and noise issues. Alternative 4 would have similar short-term impacts but for a shorter duration due to less material being removed from the site. However, a combination of air monitoring, engineering controls, and appropriate worker personal protective equipment would be used to protect the community and workers. Alternative 2 would have a higher degree of short-term effectiveness since only six inches of debris from the site surface would be removed, and the duration of on-site activities is expected to be less than that of Alternatives 3 and 4.

Implementability

Alternative 1 would be easiest both technically and administratively to implement because no additional work would be performed at the site. Alternative 2 would be the second easiest to implement technically, since there would be no excavation (except for six inches of debris removal) or treatment. However, this alternative would extremely limit site future use options and would not be consistent with the anticipated long-term use of the site. Alternatives 3 and 4 would be easy to implement technically because building demolition, excavation, and disposal are all common construction site activities, and regulatory/permitting requirements for these alternatives are not expected to be administratively intensive. Alternatives 2, 3, and 4 each have an institutional controls component, making them administratively less easy to implement than Alternative 1 due to the time involved with drafting and recording the institutional controls. Additionally, Alternative 3 may be slightly less implementable than Alternative 4 from an engineering perspective, in that tidal influences from the river may create localized fluctuations in the top of the water table in certain areas of the site. This may require an engineering component to prevent tidal influences during remediation.

Cost

Alternative 1 has no cost, Alternative 2 costs less than Alternative 4, and Alternative 3 costs the most. A detailed summary of costs for Alternative 4 is provided in TABLE 16. The capital, annual O&M, and present worth costs for each alternative are listed below.

Alternative	Capital Cost	Annual O&M	Present Worth
Alternative 1	$ 0	$ 0	$ 0
Alternative 2	$2,800,000	$771,000	$3,600,000
Alternative 3	$26,400,000	$362,000	$26,800,000
Alternative 4	$19,800,000	$376,000	$20,100,000

State Acceptance

NYSDEC concurs with the selected remedy. A letter of concurrence is attached (APPENDIX IV).

Community Acceptance

Community acceptance of the selected remedy (Debris Removal, Partial Excavation of Site Soils, Off-site Disposal, Backfill with Clean Soils, Institutional Controls, and Site Management Plan) was assessed during the public comment period. EPA believes that the community generally supports this approach. Specific responses to public comments are addressed in the Responsiveness Summary (APPENDIX V).

PRINCIPAL THREAT WASTES

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. Contaminated soil is considered to be source material; accordingly, the soils are source materials defined as principal threat wastes at the Consolidated Iron and Metal site.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon an evaluation of the alternatives and consideration of community acceptance, EPA has determined that Alternative 4 (Debris Removal, Partial Excavation of Site Soils, Off-site Disposal, Backfill with Clean Soils, Institutional Controls, and Site Management Plan) is the most appropriate remedy for the Consolidated Iron and Metal site.

The selected remedy will provide the best balance of tradeoffs among the alternatives with respect to the evaluating criteria, as described below.

Alternative 4 provides the most cost-effective solution applying the evaluation criteria given reasonably anticipated future land use of the site. Excavation of soils exceeding the residential PRG for lead to six feet bgs anticipates the construction of residential or commercial structures on the site. This remedy takes into consideration common architectural and building practices.

Soils beneath six feet bgs will be excavated, in areas where PRGs for the protection of groundwater are exceeded. Following excavation, in the event that soils below six feet need to be disturbed, a site management plan will ensure their proper handling, treatment, and disposal, if necessary. The groundwater data collected indicate that the predominant inorganic contaminants in these soils are not mobile; periodic groundwater monitoring will be performed to ensure that, following the soil excavation, the contamination is attenuating and groundwater quality continues to improve. EPA is not proposing an active groundwater remedy because of limited groundwater contamination underlying the site; instead, institutional controls will be required to prevent the use of groundwater at the site until groundwater quality standards are met.

Alternative 1 was not selected as it is simply a baseline for comparison with the other alternatives and contaminated soil that poses a human health risk would remain on the site. Alternative 2 was not selected given that the reasonably anticipated future land use of the site is not compatible with a soil cap. Alternative 3 was not selected as it is not considered to be cost-effective when compared to Alternative 4, which achieves comparable protection of human health at a lower cost.

Given these factors, Alternative 4 provides the best balance of tradeoffs among alternatives with respect to the evaluation criteria. EPA believes that Alternative 4 will be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and treatment technologies to the maximum extent practicable.

Description of Selected Remedy

Following is a summary of the selected remedy:

- a remedial design program to provide the details necessary for the construction and monitoring of the remedial program;

- removal and off-site disposal of surface debris and demolition, removal, and off-site disposal of the foundations/basements of the former process area buildings and of the former garage in its entirety;

- excavation and off-site disposal of contaminated soil exceeding the residential preliminary remediation goal (PRG) for lead (400 parts per million (ppm)) down to six feet below ground surface (bgs);

- excavation and off-site disposal of contaminated soil exceeding the PRG for VOCs and PCBs in subsurface soils (10 ppm total for each) to the water table;

- placement of a readily-visible demarcation material at the interface between the excavations and backfill;

- backfilling the excavated soil with clean fill, meeting the PRG values, to grade;

- imposition of institutional controls in the form of an environmental easement and/or restrictive covenant that will at a minimum require: (a) restricting any excavation below the soil cover's demarcation layer of six feet unless the excavation activities are in compliance with an EPA-approved site management plan (SMP); (b) restricting new construction at the site unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in compliance with an EPA-approved SMP; and (c) restricting the use of groundwater as a source of potable or process water unless groundwater quality standards are met;

- development of a site management plan that provides for the proper management of all site remedy components post-construction, such as institutional controls, and that shall also include: (a) monitoring of site groundwater to ensure that, following the soil excavation, the contamination is attenuating and groundwater quality continues to improve; (b) an inventory of any use restrictions on the site; (c) necessary provisions for ensuring the easement/covenant remains in place and is effective; (d) provision for any operation and maintenance required of the components of the remedy, and (e) the requirement that the owner or person implementing the remedy submit periodic certifications that the institutional and engineering controls are in place; and

- periodic reviews by EPA to ensure that the remedy continues to be protective of public health and the environment.

A remedial design program will be implemented to provide the details necessary for the construction and monitoring of the remedial action. The major physical construction elements of the selected remedy include removing contaminated soil from the site down to six feet bgs, removing contaminated soil exceeding 10 ppm total VOCs or

10 ppm total PCBs to the groundwater table, and backfilling the excavated areas with clean fill to grade.

The remedy includes removal and off-site disposal of surface debris and building materials from the site. Following debris and building material removal, contaminated soil down to six feet bgs that exceeds the residential PRG for lead (400 ppm) will be excavated and disposed of off-site. Because of the pervasiveness of lead throughout the site soils, cleanup to six feet bgs using the residential PRG for lead will result in meeting the PRG value for all other contaminants of concern in this zone. A demarcation layer, identified by the placement, prior to backfilling, of a readily-visible and permeable subsurface demarcation at the interface between the backfilled clean fill and soils left in place, will be employed at the site. Clean fill, meeting the PRG values, will be used to backfill the excavations to grade. The residential PRG for lead was utilized to map affected soil areas from the ground surface to six feet bgs and to calculate the volume of material that will be removed for off-site disposal. Because limited data are available to estimate the quantity of excavated material that would be classified as either hazardous or non-hazardous, the median point was selected for costing purposes (*i.e.*, 50 percent is assumed hazardous and 50 percent is assumed nonhazardous). Six feet was used for the depth of excavation based on the type of construction expected from reasonably anticipated future land use. The site is currently zoned for mixed use, including residential, recreational, and commercial uses; based on correspondence and discussions with the City of Newburgh, EPA's remedy would be consistent with the City's anticipated future use of the site, which includes commercial, recreational, and restricted residential development.

Between six feet and the water table, the subsurface PRG for VOCs and PCBs (10 ppm total for each) was utilized to map affected subsurface soil areas and to estimate the volume of material that will be removed for off-site disposal. For soils between six feet bgs to the water table, those soils containing VOCs and PCBs exceeding the PRGs will be removed from the site to eliminate the potential for migration of these contaminants to site groundwater. These areas will also be backfilled with clean fill meeting the PRGs. The estimated volume of soils to be removed from the site is 78,000 cubic yards.

This response action also includes institutional controls. Specifically, an environmental easement/restrictive covenant will be filed in the property records of the Orange County Clerk's

Office. The easement/covenant will at a minimum require: (a) restricting any excavation below the soil cover's demarcation layer at six feet bgs unless the excavation activities are in compliance with an EPA-approved site management plan (SMP); (b) restricting new construction at the site unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in compliance with an EPA-approved SMP; and (c) restricting the use of groundwater as a source of potable or process water unless groundwater quality standards are met.

A SMP will be developed to address soils below six feet bgs that are left in place. These soils are primarily impacted by lead, which, based on sampling and analysis of site groundwater, is not mobile. The SMP will include guidelines to be followed during any excavations below the soil cover's demarcation layer. Excavated soils below the demarcation layer would need to be tested and properly handled to protect the health and safety of workers and the nearby community. In addition, the SMP will provide for the proper management of all site remedy components post-construction, such as institutional controls, and will also include: (a) monitoring of site groundwater to ensure that, following the soil excavation, the contamination is attenuating and groundwater quality continues to improve; (b) an inventory of any use restrictions on the site; (c) necessary provisions for ensuring the easement/covenant remains in place and is effective; (d) provision for any operation and maintenance required of the components of the remedy, and (e) the requirement that the owner or person implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

Periodic reviews by EPA to ensure that the remedy continues to be protective of public health and the environment will also be conducted. Because this response action will result in contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the remaining contaminated soils.

Summary of Estimated Remedy Costs

The total estimated present worth cost for the selected remedy alternative is $20,141,000. This includes an estimated $376,000 in operation and maintenance for 30 years.

The information in this cost estimate summary is based on the best available information regarding the anticipated scope of Alternative 4. These are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project. Changes in the cost elements are likely to occur as a result of updated information on the quantity of soil that requires excavation, particularly below six feet, and on the hazardous or non-hazardous disposal requirements for the site soils. These elements will be determined during the pre-design investigation and remedial design of the components of this alternative. Major changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Difference, or a ROD amendment.

Expected Outcomes of Selected Remedy

Implementation of Alternative 4 will eliminate potential risks associated with exposure to contaminated soil in the top six feet of soil. Removal of six feet of soil will allow for mixed commercial, residential, and recreational re-use of the site. Excavation of soil between six feet and the water table for PCBs and VOCs exceeding 10 ppm will prevent leaching of these contaminants into the groundwater. Implementation of a site management plan and institutional controls will ensure continued protection of human health and the environment after the remedy is completed. Construction of the remedy is expected to take approximately 18 months. This does not include the time required to negotiate with potentially responsible parties, design the remedy, procure contracts for design and construction, or put institutional controls in place.

The cleanup levels, summarized in TABLES 13 and 14, are based on ARARs, guidance values, or risk-based values (*i.e.*, EPA and/or NYSDEC standards).

Institutional controls in the form of an environmental easement/restrictive covenant will be filed in the property records of the Orange County Clerk's Office. A site management plan will be developed to address soils beneath six feet bgs that are left in place. A review of site conditions will be conducted no less often than every five years after completion of the construction of the remedy to ensure that the remedy remains protective of human health and the environment.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete the selected remedial action for this site must comply with applicable, or relevant and appropriate environmental standards established under Federal and State environmental laws unless a waiver from such standards is justified. The selected remedy also must be cost effective and utilize permanent solutions and alternative treatment technologies or resource-recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances, as available. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment. Alternative 4 is protective of human health because it will eliminate human exposure to contaminated soil likely to be encountered based on reasonably anticipated future land use. It also employs institutional controls and provides a site management plan to protect human health and the environment from contaminated soils left in place.

Compliance with ARARs

The NCP (§§300.430(f)(5)(ii)(B) and (C)) requires that the selected remedy attain Federal and State ARARs. There are currently no federal or New York State promulgated standards for contaminant levels in soils. There are, however, other federal or state advisories, criteria, or guidance (i.e., TBCs), one of which is the NYS TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, No. 94-HWR-4046, January 24, 1994. The soil cleanup objectives identified in NYSDEC's TAGM are either a human health protection value or a value based on protection of groundwater (calculating the concentration in soil which would theoretically produce contaminant concentrations in the groundwater which would meet groundwater standards), whichever is more stringent. EPA has reviewed the TAGM model's formula and assumptions and has determined that the TAGM objectives for VOCs will be protective of human health and the groundwater. The NYSDEC recommended soil cleanup objectives and site-specific human health risk assessment-based cleanup criteria were used to develop the PRGs. Alternative 4 will achieve all PRGs from the surface to six feet bgs and PRGs for the protection of groundwater site-wide. Although some soils exceeding the PRGs will be left in-place at depth, the contamination is not considered to be mobile and those soils are unlikely to be accessed through reasonably anticipated future land use. A SMP would be employed to ensure proper handling, treatment, and disposal, if necessary, of soils should excavations be required below six feet.

Alternative 4 would comply with the following ARARs, Other Criteria, Advisories, or Guidances identified for the site and will be demonstrated through monitoring, as appropriate.

ARARs, Other Criteria, Advisories, or Guidances:

<u>General - Site Remediation</u>

- Occupational Safety and Health Administration Worker Protection (29 CFR 1904, 1910, 1926).
- RCRA, 42 U.S.C. §6901, et seq.: Identification and Listing of Hazardous Waste (40 CFR 261); Standards Applicable to Generators of Hazardous Waste (40 CFR 262); Standards Applicable to Owners and Operators of Treatment, Storage, and Disposal Facilities (40 CFR 264).

<u>Transportation of Hazardous Waste</u>

- Department of Transportation (DOT) Rules for Transportation of Hazardous Materials (49 CFR 107, 171, 172, 177, and 179).
- Standards Applicable to Transporters of Hazardous Waste (40 CFR 263).

<u>Disposal of Hazardous Waste</u>

- RCRA Land Disposal Restrictions (40 CFR 268).
- Toxic Substances Control Act (TSCA), 15 U.S.C. §2601, et seq.

<u>Off-Gas Management</u>

- Clean Air Act (CAA), 42 U.S.C. §7401, et seq.
- National Ambient Air Quality Standards (40 CFR 50).

<u>New York Solid and Hazardous Waste Management Regulations (6 NYCRR)</u>

- Hazardous Waste Management System - General (Part 370).
- Solid Waste Management Facilities (Part 360).
- Identification and Listing of Hazardous Wastes (Part 371).

NYS Transportation of Hazardous Waste (6 NYCRR)

- Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (Part 372).
- Waste Transporter Permit Program (Part 364).

NYS Disposal of Hazardous Waste (6 NYCRR)

- Standards for Universal Waste (Part 374-3).
- Land Disposal Restrictions (Part 376).

Off-Gas Management (6 NYCRR)

- New York General Prohibitions (Part 211).
- New York Air Quality Standards (Part 257).

Coastal Zone

- Coastal Zone Management Act (16 United States Code [USC] 33).

Wetlands and Flood Plains Standards and Guidelines

- Statement on Procedures on Flood plain Management and Wetlands Protection (40 CFR 6 Appendix A).
- Policy on Floodplains and Wetland Assessments for CERCLA Actions (Office of Solid Waste and Emergency Response (OSWER) Directive 9280.0-12, 1985).
- RCRA Location Standards (40 CFR 264.18).
- Flood plain Executive Order (EO) (EO 11988).
- National Environmental Policy Act4 (42 USC 4321: 40 CFR 1500 to 1508).
- CWA Section 404 (b)(1) Guidelines for Specification of Disposal Sites for Dredge or Fill Material; Section 404(c) Procedures; 404 Program Definitions; 404 State Program Regulations.

Wildlife Habitat Protection Standards and Guidelines

- Fish and Wildlife Coordination Act (16 USC 661).
- Fish and Wildlife Conservation Act (16 USC 2901 *et seq.*).
- Endangered Species Act (16 USC 1531 *et seq.*).

Historic Preservation Standards and Guidelines

- National Historic Preservation Act (40 CFR 6.301).

Wetlands and Flood Plains Standards and Guidelines (6 NYCRR)

- New York Wetland Laws (Articles 24-25).
- New York Freshwater Wetland Permit Requirements and Classification (Articles 663 and 664).

- Flood plain Management Regulations - Development Permits (500 ECL Article 36).

Wildlife Habitat Protection Standards and Guidelines (6 NYCRR)

- Endangered and Threatened Species of Fish and Wildlife (Part 182).

Soil Cleanup Objectives and Cleanup Levels

- NYS Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, No. 94-HWR-4046, January 24, 1994.

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP §§300.430(f)(1)(i)(B)). Overall effectiveness is based on the evaluations of: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost effective (NCP §§300.430(f)(1)(ii)(D)).

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital costs and O&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual costs were calculated for 30 years using a seven percent discount rate (consistent with the FS and Proposed Plan). For a detailed breakdown of costs associated with the selected remedy see TABLE 16.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum practicable extent to which permanent solutions and treatment technologies can be utilized. The excavated soil will be tested to determine if treatment is necessary prior to disposal at the selected facility.

The selected remedy represents the most appropriate solution at the site because it provides the best balance of tradeoffs among the alternatives with respect to the evaluation criteria.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is not fully satisfied through the implementation of the selected remedy. However, removal of the top six feet of soil will be protective of human health and the environment as it is based on common architectural and building practices. It is compatible with the reasonably anticipated future land use at the site. Soils below six feet will be excavated where a threat to groundwater due to the mobility of VOCs and PCBs exists. The remaining soils are unlikely to be disturbed given the anticipated future site use, but in the event that they are, a site management plan will ensure their proper handling and treatment. Periodic groundwater monitoring will be performed to confirm that source removal actions have a positive impact on groundwater quality.

Five-Year Review Requirements

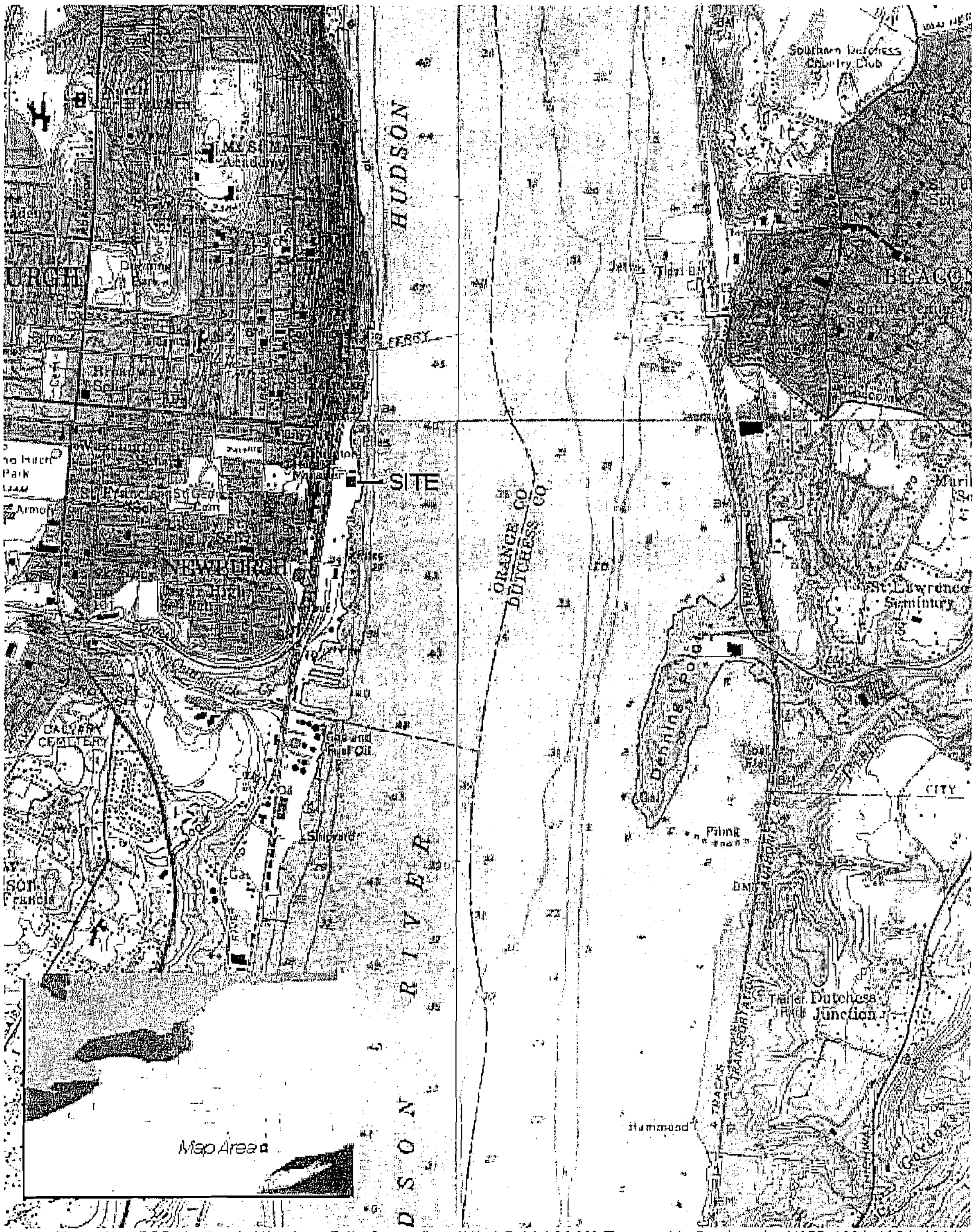
Because the selected remedy results in contaminants remaining on-site above levels that would allow for unlimited use and unrestricted exposure, a review of site conditions will be conducted no less often than every five years after completion of the construction of the remedy. The site reviews will include an evaluation of the remedy components to ensure that the remedy remains protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

There were no significant changes from the preferred remedy presented in the July 2006 Proposed Plan.

<u>APPENDIX I</u>

FIGURES



adapted from the USGS Newburgh, Wappinger Falls, Cornwall, and West Point 1:24,000 Topographic Quadrangles (1957, 1981, 1981, 1981)

0 — 1 Mile

N

Figure 1
Site Location Map

Consolidated Iron and Metal Superfund Site

Newburgh, Orange County, New York

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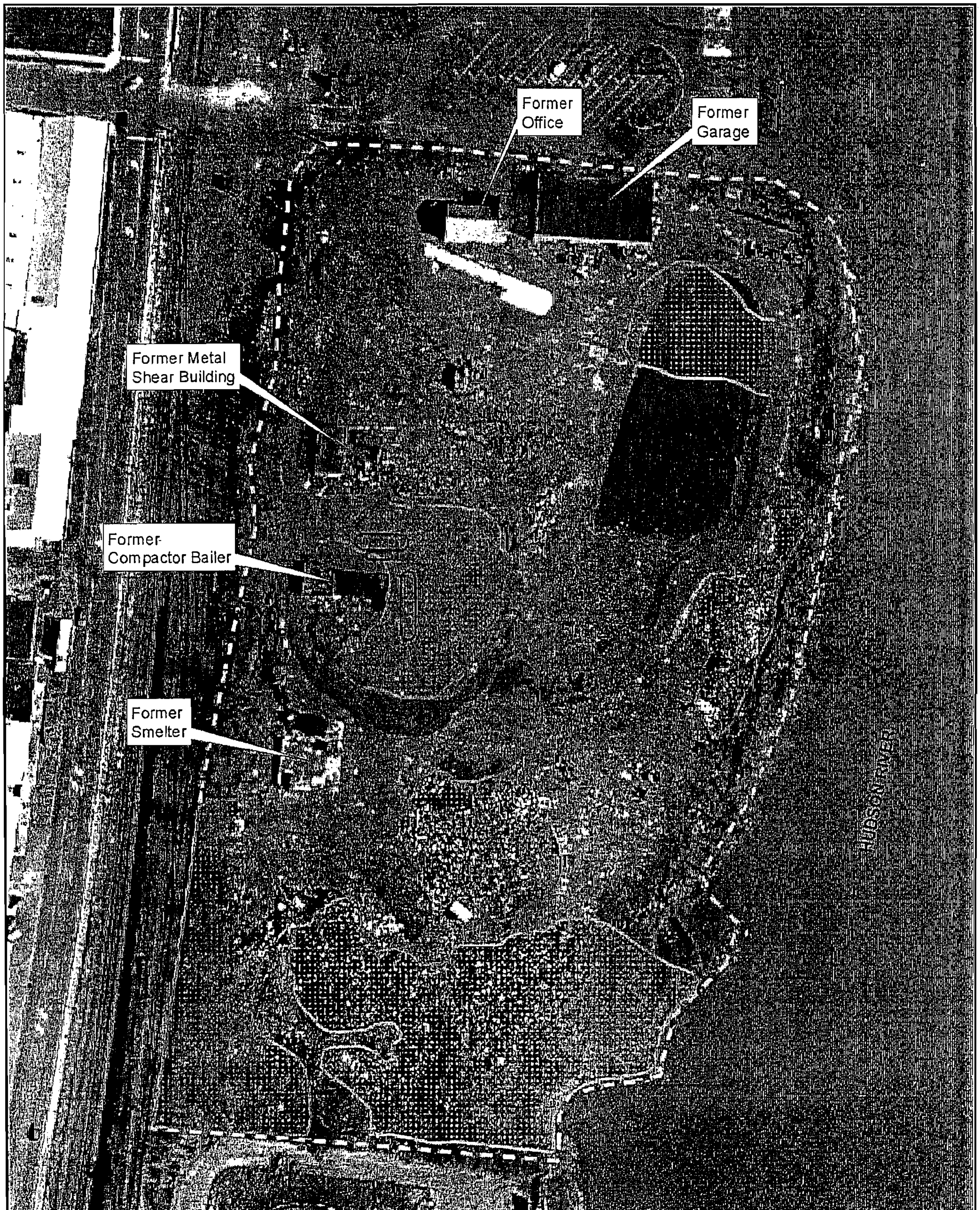


Note: aerial photograph dated April 2001

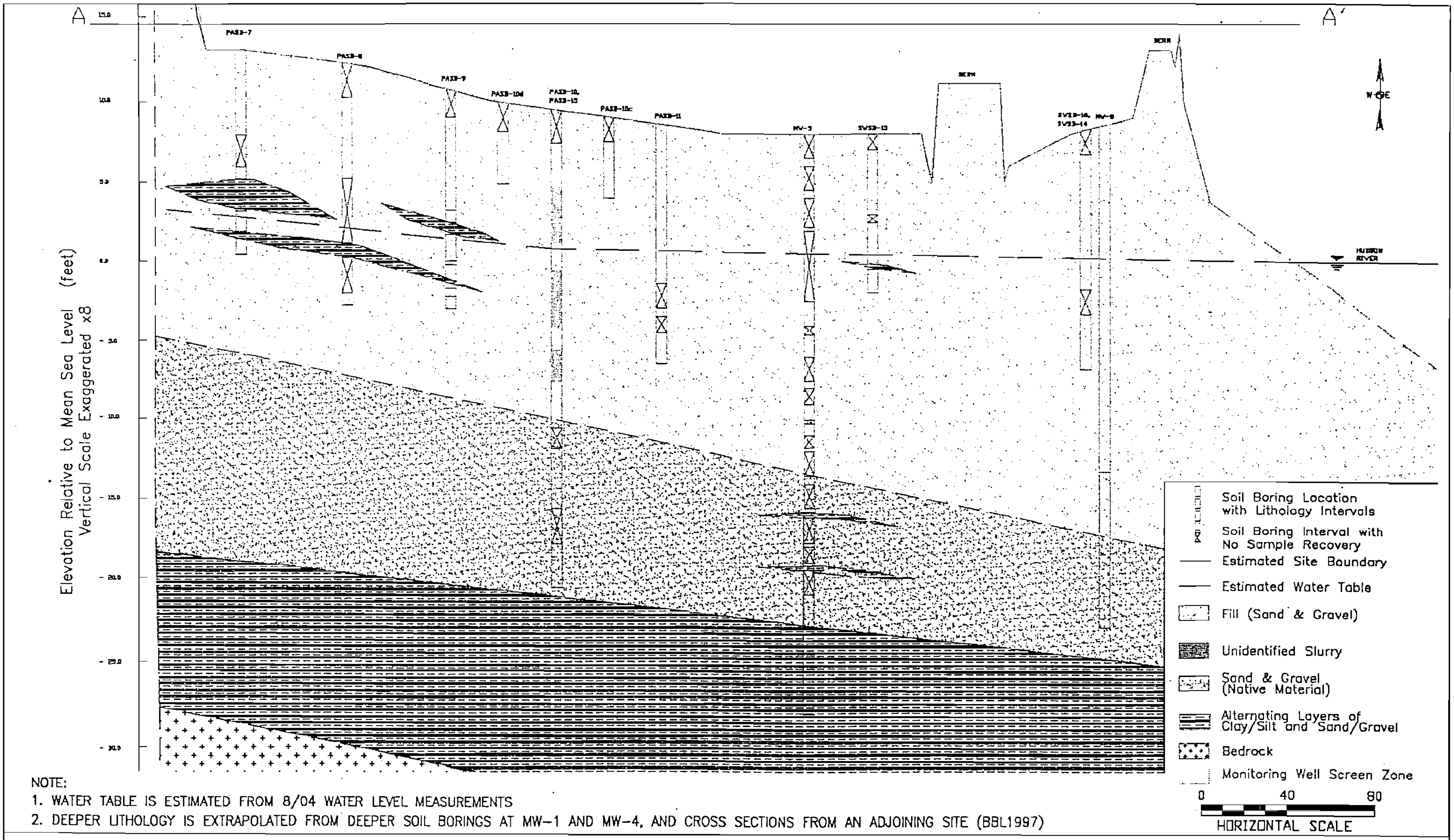
LEGEND

- Former Ash/ Slag Pile
- Former Soil Pile
- Former Underground Storage Tank
- Former Tire Pile
- Former Scrap Metal Pile
- Site Boundary

0 25 50 100 150 Feet

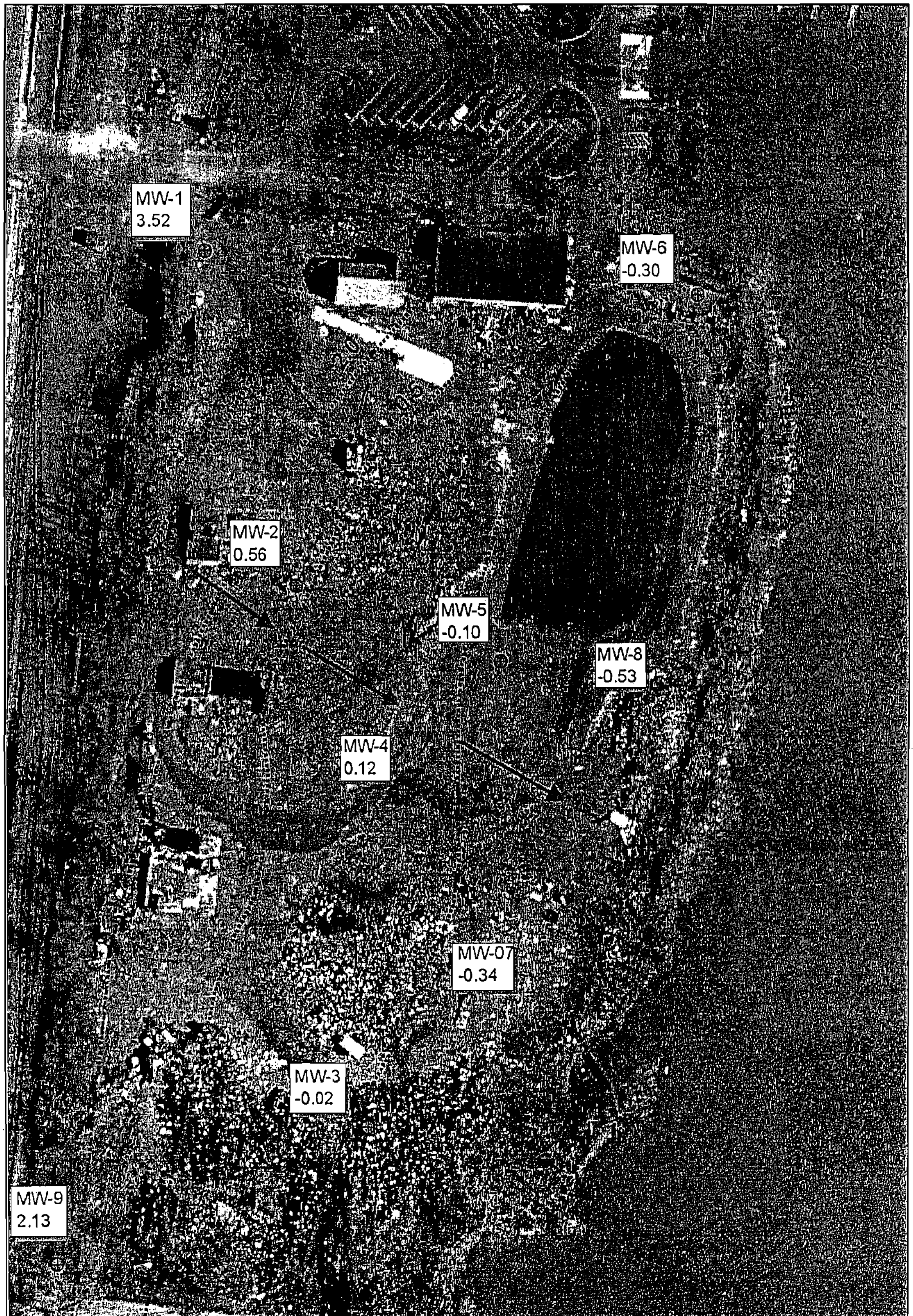
Figure 2
Site Map

Consolidated Iron and Metal Superfund Site
Newburgh, Orange County, New York



NOTE:
1. WATER TABLE IS ESTIMATED FROM 8/04 WATER LEVEL MEASUREMENTS
2. DEEPER LITHOLOGY IS EXTRAPOLATED FROM DEEPER SOIL BORINGS AT MW-1 AND MW-4, AND CROSS SECTIONS FROM AN ADJOINING SITE (BBL1997)

Figure 3
Geologic Cross Section AA'
Consolidated Iron and Metal Superfund Site
Newburgh, Orange County, New York



Note: aerial photograph dated April 2001

LEGEND

- Monitoring Wells with Water Level Elevations in Feet Above Mean Sea Level
- 3.0 Groundwater Contour Line with Elevations in Feet Above Mean Sea Level
- Groundwater Flow Direction

N

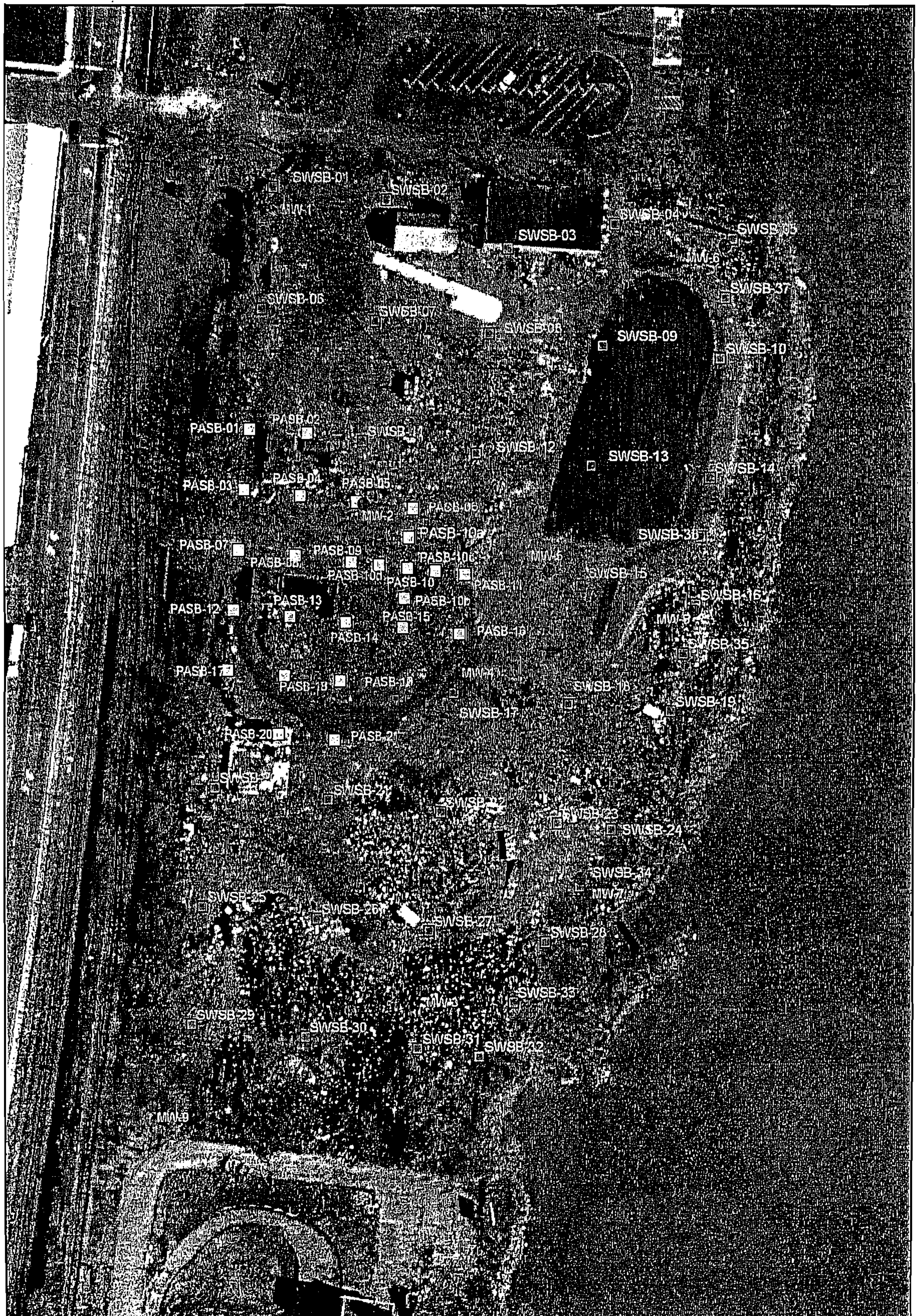
0 20 40 80 120 Feet

Figure 4

Groundwater Contour Map, November 2004

Consolidated Iron and Metal Superfund Site

Newburgh, Orange County, New York

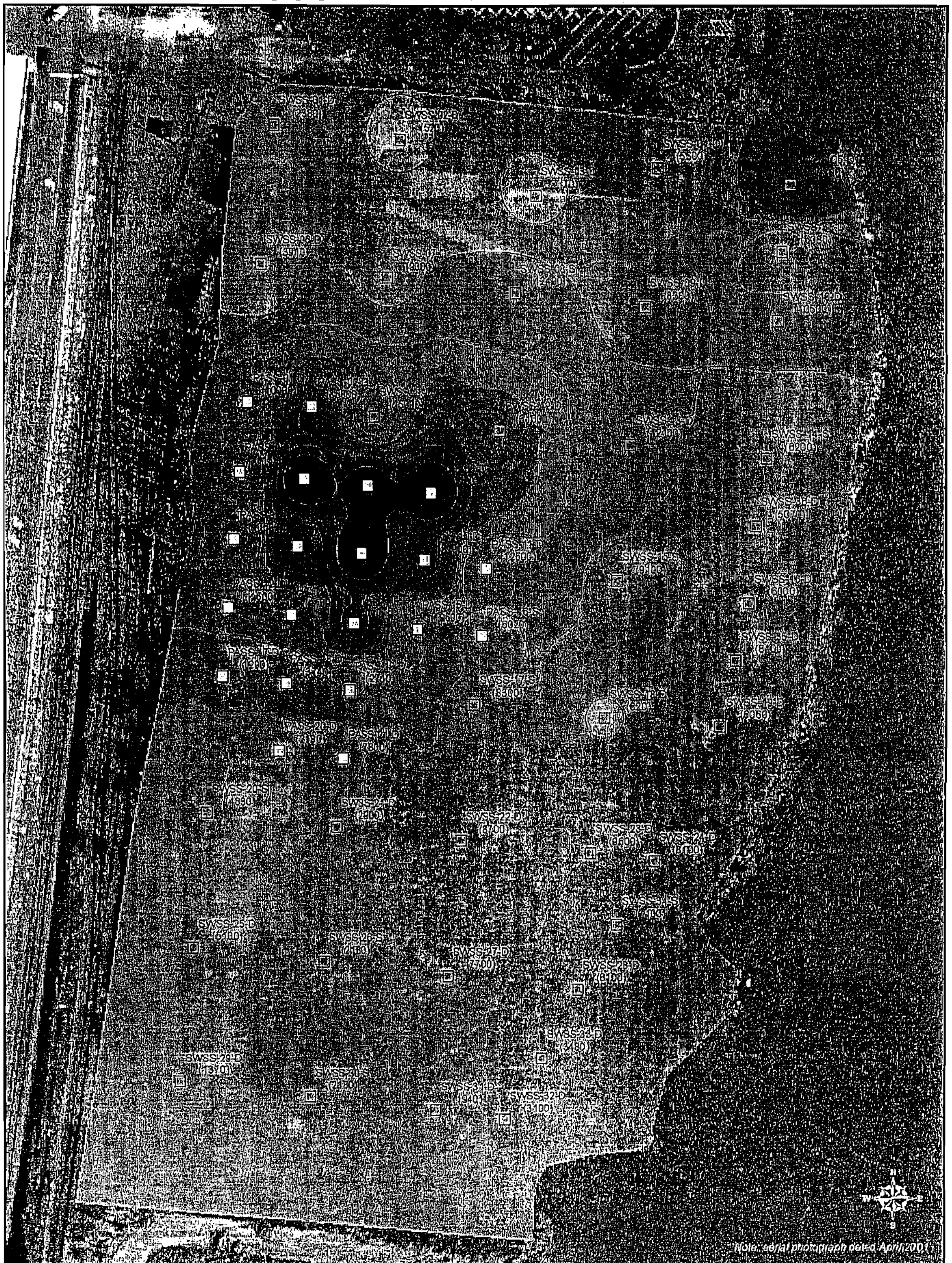


Note: aerial photograph dated April 2001

LEGEND
- ☐ Site-Wide Soil Borings
- ● Monitoring Wells
- ☐ Process Area Soil Borings

0 25 50 100 150 Feet

Figure 5
Process Area Soil Borings, Site-Wide Soil Borings, and Monitoring Well Locations
Consolidated Iron and Metal Superfund Site
Newburgh, Orange County, New York



Legend

- SWSS: Site-wide Surface Soil Sample Location
- PASS: Process Area Surface Soil Sample Location
- Total PCBs Concentration Contour
- (000) Total PCBs in ug/kg

Total PCBs (ug/kg)

- 70 - 1,000
- 1,000 - 10,000
- 10,000 - 20,000
- 20,000 - 30,000
- 30,000 - 40,000
- 40,000 - 50,000
- 50,000 - 60,000
- 60,000 - 70,000

Note: No qulifiers are shown as the values are a sum of total PCBs
Potential cleanup level (TAGM) = 1 ppm (1,000 ug/kg)

0 25 50 100 Feet

Figure 6
Surface Soil Total PCBs Isoconcentration Map
Consolidated Iron and Metal Superfund Site
Newburgh, Orange County, New York

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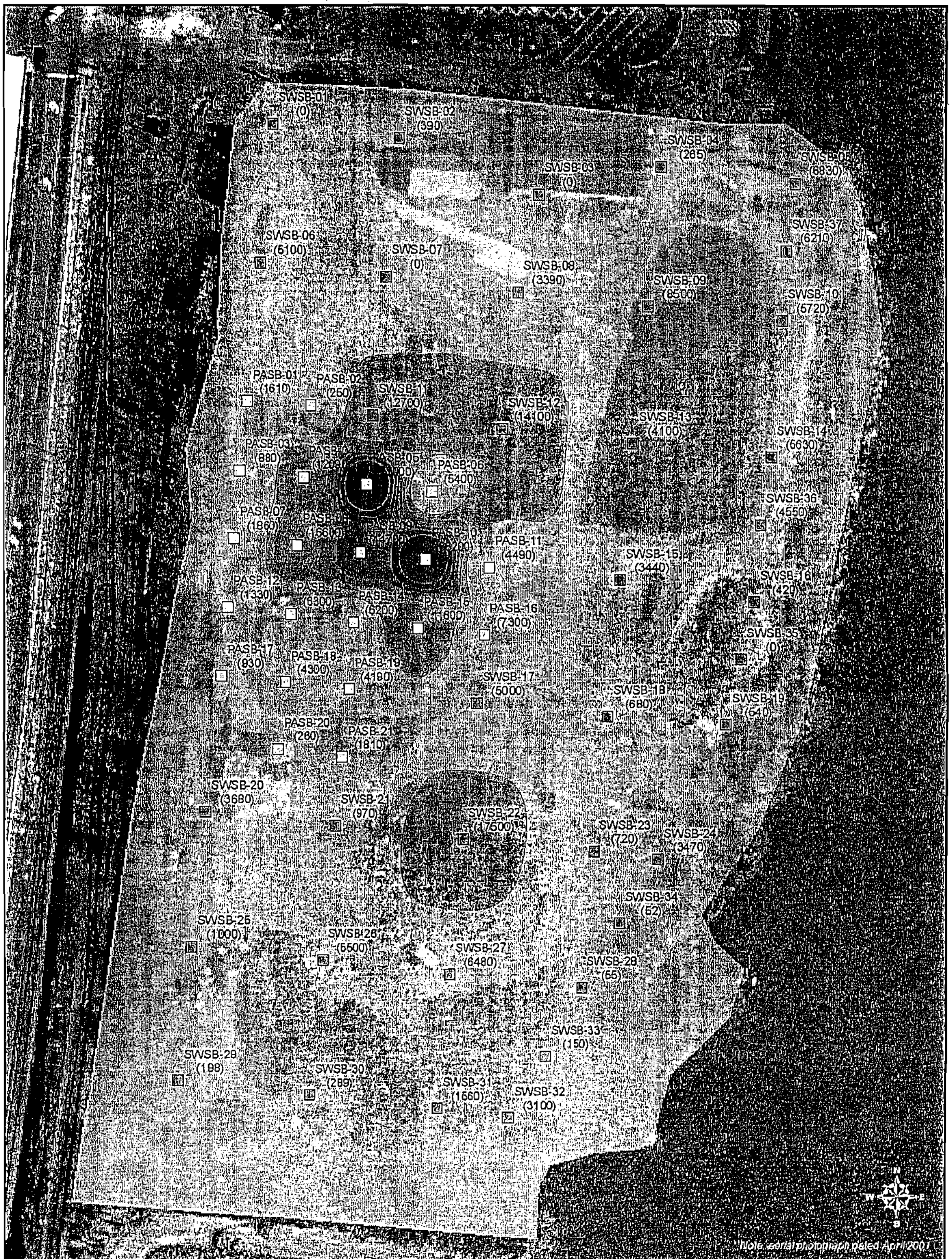

Legend

- SWSB: Site-wide Subsurface Soil Sample Location
- PASB: Process Area Subsurface Soil Sample Location
- Total PCBs Concentration Contour
- (000) Total PCBs in ug/kg

Total PCBs (ug/kg)

0 - 10,000	40,000 - 50,000
10,000 - 20,000	50,000 - 60,000
20,000 - 30,000	60,000 - 70,000
30,000 - 40,000	70,000 - 77,000

Note: No qulifiers are shown as the values are a sum of total PCBs
Potential cleanup level (TAGM) = 10 ppm (10,000 ug/kg)

0 25 50 100 Feet

Figure 7
Subsurface Total PCBs Isoconcentration Map
Consolidated Iron and Metal Superfund Site
Newburgh, Orange County, New York

C:\MS\GIS\ConsolidatedIron\GISProjectFile\ArcMap Projects\SS_Lead_contours.mxd

Legend

- ⊡ SWSS: Site-Wide Surface Soil Sample Location
- ☐ PASS: Process Area Surface Soil Sample Location
- — PASS & SWSS Lead Concentration Contour

Lead mg/kg

400 - 2,000	8,000 - 10,000
2,000 - 4,000	10,000- 12,000
4,000 - 5,000	12,000- 14,000
5,000 - 6,000	14,000 - 16,000
6,000 - 8,000	

All values in mg/kg
R = rejected data
J = estimated data due to exceeded quality control criteria
Lead Site-Specific Soil Screening Criteria = 400 mg/ kg
Potential Clean-up Level (CRQL) = 5000 mg/kg

0 25 50 100 150 Feet

Figure 8
Surface Soil Lead Isoconcentration Map
Consolidated Iron and Metal Superfund Site
Newburgh, Orange County, New York

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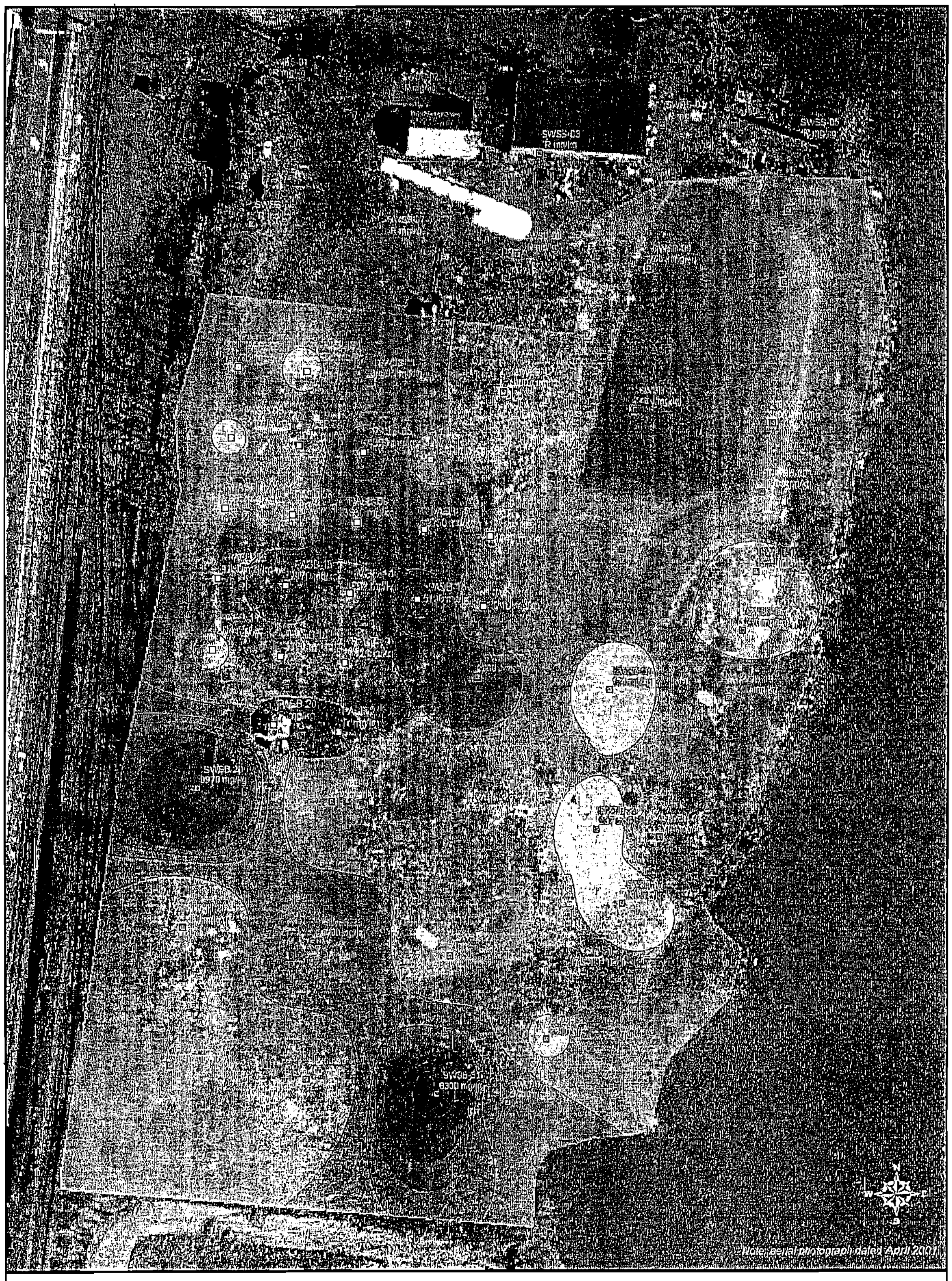

Legend

- SWSB: Site-Wide Subsurface Soil Sample Location
- PASB: Process Area Subsurface Soil Sample Location
- — Lead Concentration Contour

Lead mg/kg

- 0 - 400
- 400- 2,000
- 2,000 - 4,000
- 4,000 - 5,000
- 5,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

All values in mg/kg
R = rejected data
J = estimated data due to exceeded quality control criteria
Lead Site-Specific Soil Screening Criteria = 400 mg/kg
Potential Clean-up Level (CRQL) = 5000 mg/kg

0 25 50 100 150 Feet

Figure 9
Suburface Soil Lead Isoconcentration Map
Consolidated Iron and Metal Superfund Site
Newburgh, Orange County, New York

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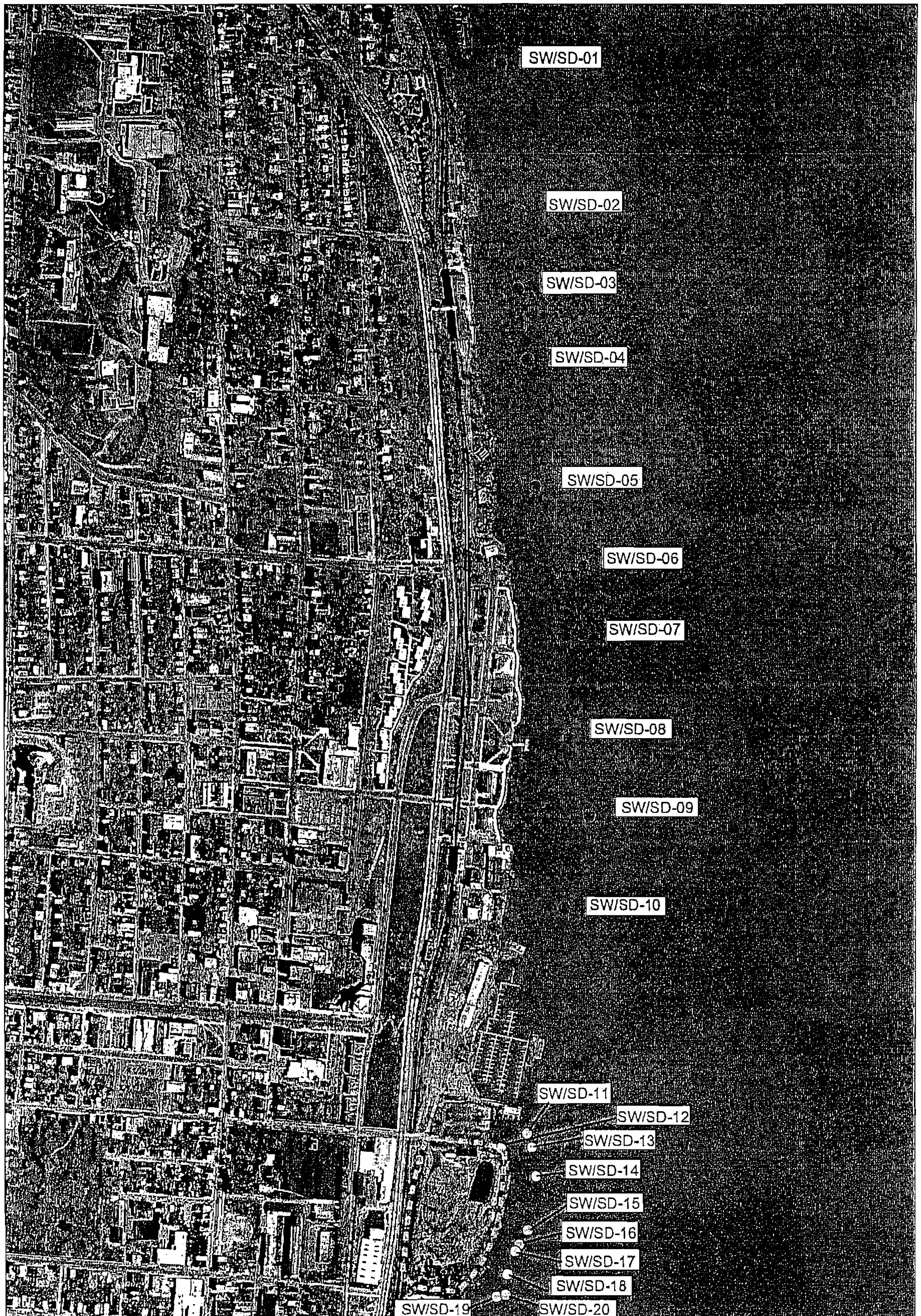

Note: aerial photograph dated April 2001

LEGEND

- Sediment and Surface Water Sample Locations
- Background Sediment and Surface Water Sample Locations
- Site Boundary

0 250 500 1,000 Feet

Figure 10

Sediment and Surface Water Sample Locations

Consolidated Iron and Metal Superfund Site

Newburgh, Orange County, New York

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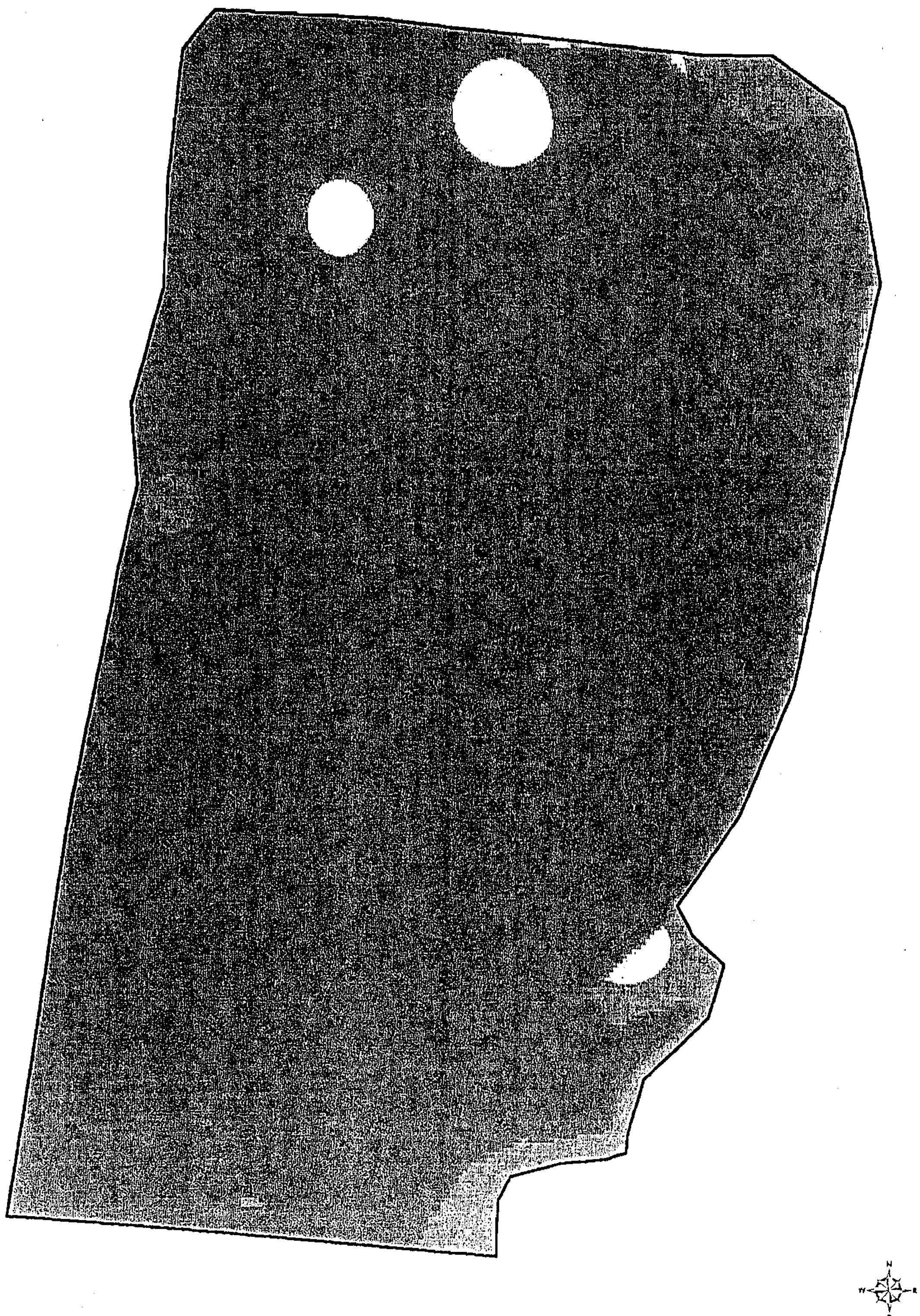
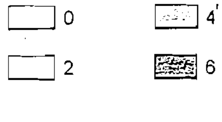


Soil Excavation Depth - Feet bgs



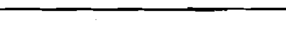


Figure 11
Soil Excavation Depths
Alternative 4: Partial Excavation
Consolidated Iron and Metal Superfund Site
Newburgh, Orange County, New York

APPENDIX II

TABLES

Table 1
Process Area Soil Boring Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	PASS-01-S		PASB-01		PASS-02-D		PASB-02		PASS-03-D		PASB-03		PASS-04-D		PASB-04		PASS-05-S		PASB-05		PASS-06-D		PASB-06	
VOCs																									
m,p-Xylenes (total)	5813	-----	UJ	-----	UJ	-----	UJ	-----	U	-----	UJ	-----		-----	UJ	-----		-----	UJ	29000		-----	R	-----	
SVOCs																									
Phenol	145	-----	UJ	-----	U	-----	UJ	-----	U	-----	UJ	-----	U	-----	UJ	-----	U	-----	UJ	-----	U	-----	UJ	-----	U
Benzo(a)anthracene	620	2400		640		12000		1700		3100		-----	J	19000		1500	J	4800		8800		5000		900	J
Chrysene	1938	2800		-----		13000		1800		3600		-----	J	22000		1700	J	5800		9300		5900		-----	J
bis(2-Ethylhexyl) phthalate	35000	-----		-----		-----		-----	J	40000		-----		63000		-----		-----		68000		73000		37000	
Benzo(b)fluoranthene	620	2900		710		13000		1400		3300		-----	J	22000		1200	J	5900		6500		5500		760	J
Benzo(k)fluoranthene	5329	-----		-----		10000		-----		-----		-----	J	20000		-----	J	5200		7500		4900		-----	J
Benzo(a)pyrene	62	2900		680		13000		1600		3500		240	J	23000		1200	J	6100		7100		5700		780	J
Indeno(1,2,3-cd)pyrene	620	2400		-----	J	12000		900	J	2900		-----	J	17000		680	J	4600		3800	J	3600	J	-----	J
Dibenz(a,h)anthracene	62	700	J	120	J	3600	J	240	J	900	J	-----	U	5500		240	J	1300	J	1200	J	1000	J	-----	U
P/PCBs																									
Heptachlor	110	-----	UJ	-----	U	-----	J	-----	U	-----	J	-----	J	570	J	-----	U	340	J	510	J	800	J	-----	U
Heptachlor epoxide	53	-----	R	-----	R	-----	R	-----	J	-----	R	-----	U	-----	UJ	-----	U	-----	UJ	-----	UJ	-----	UJ	-----	U
Endrin	97	460	J	-----	J	1100	J	-----	U	470	J	-----	U	2500	J	-----	J	2900	J	1500	J	2200	J	-----	J
4,4'-DDD	2400	-----	UJ	-----	U	-----	UJ	-----	J	-----	UJ	-----	JN	-----	UJ	-----	U	-----	UJ	-----	UJ	-----	UJ	-----	J
4,4'-DDT	1700	-----	UJ	-----	U	-----	UJ	-----		-----	J	-----		3000	J	-----	U	-----	UJ	1800	J	2700	J	-----	
Aroclor-1242	970	-----	UJ	-----	U	-----	UJ	-----	U	-----	UJ	-----	U	35000	J	7700		28000	J	35000		38000	J	1800	
Aroclor-1248	970	3800	J	-----		14000	J	-----	U	4000	J	-----		-----	UJ	-----	U	-----	UJ	-----	UJ	-----	UJ	-----	U
Aroclor-1254	110	6200	J	840		17000	J	250	J	5600	J	310		33000	J	3400		35000	J	27000		28000	J	2200	
Aroclor-1260	970	-----	UJ	-----		4800	J	-----	U	1700	J	-----	J	-----	UJ	-----		-----	UJ	15000	J	-----	UJ	1400	
Inorganics																									
Aluminum	7600	18600				.19200		7660	J	23700		15400	J	27100		15000	J	31500		24100	J	37600		12300	J
Antimony	3.1	15				34.6		9.4	J	17		5.7	J	52		39.1	J	51.3		-----	UJ	97.5		19.7	J
Arsenic	0.39	10.9		9.8		15.3		13.4		9.9		9.7		23.4		18.9		24.3		49.8		26.4		20.8	
Barium	300	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	838	J	-----	J	-----	J	1160	J	682	J	551	J
Beryllium	0.16	0.49		0.54		0.34	J	0.7		0.47	J	0.63		0.64		0.83		0.36	J	0.39	J	0.4	J	0.46	J
Cadmium	1	11.1		4.2	J	31.9		3.1	J	12.8		6.5	J	30.2		18.1	J	31.9		30.9	J	96.5		20.1	J
Chromium	10	77.1		-----	R	114		-----	R	69		-----	R	187		-----	R	143		-----	R	153		-----	R
Copper	25	909		265	J	1420		114	J	1210		210	J	5840	D	221	J	2350		1460	J	2730		231	J
Iron	2000	51800		33600	J	94400		60200	J	51300		39100	J	127000		44900	J	95200		2E+05	J	89000		74500	J
Lead	400	1000		421	J	1880		-----	J	1560		-----	J	4070		876	J	3530		4520	J	3970		1810	J
Manganese	180	672		509	J	851		495	J	695		918	J	1040		736	J	931		1150	J	909		1060	J
Mercury	0.1	3.5		2	J	7.3	D	0.36	J	1.9		0.86	J	12.6	D	3	J	10.6	D	9.1	J	5.1		1.6	J
Nickel	13	101	J	-----	R	177	J	-----	R	87.8	J	-----	R	238	J	-----	R	239	J	-----	R	216	J	-----	R
Selenium	2.76	-----	U	2.5	J	-----	U	2.8	J	-----	U	3.3	J	-----	U	2.2	J	-----	U	-----	R	-----	U	-----	R
Thallium	1	-----	U	1.4	J	-----	U	2.4	J	-----	U	2.3	J	-----	U	2.5	J	-----	U	5.9		-----	U	3.3	
Vanadium	7.8	51.1		34.5		119		28.5		53.5		25		204		26.7		126		73.3		114		26	
Zinc	20	2000	J	2450	J	4250	J	440	J	2280	J	944	J	6200	J	999	J	10900	J	33300	J	5410	J	2450	J

Table 1
Process Area Soil Boring Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	PASS-07-D	PASB-07	PASS-08-D	PASB-08	PASS-09-D	PASB-09	PASS-10-D	PASB-10	PASS-11-D	PASB-11	PASB-11-DUP	PASS-12-D	PASB-12
VOCs														
m,p-Xylenes	5813	----- UJ	----- J	----- UJ	----- J	----- UJ	14000	----- UJ	5500	----- UJ	5600	6800	----- UJ	----- J
SVOCs														
Phenol	145	----- UJ	----- U	----- UJ	----- U	----- UJ	230 J	----- UJ	----- U	----- UJ	----- U	----- U	----- UJ	----- U
Benzo(a)anthracene	**620**	2100	----- J	4800	2200	1300 J	1100 J	4100 J	1100 J	1600 J	1800 J	2300 J	2700 J	1600 J
Chrysene	1938	2400	----- J	5500	2200	1500 J	1600 J	4600 J	----- J	1600 J	2300 J	3000 J	2900 J	2000
bis(2-Ethylhexyl) phthalate	35000	-----	----- J	-----	-----	----- J	-----	----- J	48000	----- J	-----	-----	----- J	-----
Benzo(b)fluoranthene	**620**	2500	870 J	5700	2100	1900 J	1500 J	4600 J	1200 J	1600 J	1400 J	1400 J	3200 J	1500 J
Benzo(k)fluoranthene	5329	-----	----- J	4900	-----	----- J	----- J	4000 J	----- J	----- J	----- J	----- J	----- J	----- J
Benzo(a)pyrene	**62**	2600	680 J	5900	2100	1400 J	1200 J	5000 J	1000 J	1700 J	1800 J	1900 J	3200 J	1700 J
Indeno(1,2,3-cd)pyrene	**620**	2000	----- J	4700	1600 J	1500 J	790 J	4000 J	700 J	1300 J	1100 J	860 J	2700 J	1300 J
Dibenz(a,h)anthracene	**62**	550 J	200 J	1300 J	390 J	500 J	----- U	1400 J	----- U	450 J	----- U	----- U	750 J	350 J
P/PCBs														
Heptachlor	110	----- UJ	----- J	320 J	----- J	450 J	----- UJ	290 J	950 J	----- J	----- U	----- J	----- J	----- J
Heptachlor epoxide	53	----- R	----- U	----- UJ	----- R	----- UJ	----- UJ	----- UJ	----- R	----- R	----- U	----- U	----- R	----- U
Endrin	97	420 J	----- J	1500 J	----- U	1300 J	860	1400 J	380 J	----- J	----- J	----- J	490 J	----- R
4,4'-DDD	2400	----- UJ	----- U	----- UJ	12000	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- J	----- J	----- UJ	----- J
4,4'-DDT	1700	----- UJ	-----	----- UJ	2200 J	1900 J	----- J	----- UJ	----- J	----- UJ	-----	----- J	----- UJ	-----
Aroclor-1242	970	----- UJ	-----	21000 J	7500	----- UJ	24000	----- UJ	54000	----- UJ	1900	2800	----- UJ	----- U
Aroclor-1248	970	3500 J	----- U	----- UJ	----- U	37000 J	----- UJ	23000 J	----- UJ	4600 J	----- U	----- U	3600 J	-----
Aroclor-1254	**110**	5000 J	770	20000 J	6700	24000 J	14000	22000 J	9600	5800 J	1700	2900	6100 J	560
Aroclor-1260	970	2100 J	-----	6600 J	2400	6100 J	6700 J	6900 J	2600 J	2100 J	-----	1200	1800 J	-----
Inorganics														
Aluminum	7600	26900	19700 J	37400	17700 J	44500	104001 J	42000	49400 J	61100	55800 J	42200 J	32900	18300 J
Antimony	3.1	22.2	5.8 J	85.1	14 J	43.9	32.8 J	47.2	42.1 J	25.4	14.6 J	13.8 J	14.8	6.7 J
Arsenic	**0.39**	10.3	6.9	27	20	22.8	35.2	28.4	25.3	7.3	18.1	17.8	10.2	10.1
Barium	300	----- J	----- J	1930 J	----- J	622	909 J	-----	681 J	-----	----- J	----- J	-----	----- J
Beryllium	0.16	0.51 J	0.64	0.68	0.82	0.41 J	0.47 J	0.41 J	0.38 J	0.39 J	0.47 J	0.45 J	0.47 J	0.85
Cadmium	**1**	12.3	3.9 J	78.4	27.9 J	42.5	85.4 J	46.6	42.3 J	9.3	22.6 J	21.3 J	11.2	7.3 J
Chromium	10	83.7	----- R	184	----- R	230	----- R	177	----- R	103	----- R	----- R	93.8	----- R
Copper	**25**	1350	330 J	2710	2770 J	2970	5150 J	2760	6650 J	4780 D	2440 J	1740 J	1840	670 J
Iron	**2000**	52600	37000 J	90500	57100 J	93400 J	117999 J	99400 J	79100 J	60000 J	53700 J	72800 J	49600 J	45000 J
Lead	**400**	1270	685 J	3270	1180 J	3580	3860 J	3930	2250 J	4680	1640 J	1560 J	1250	1930 J
Manganese	180	733	790 J	1010	979 J	904	1250 J	1080	917 J	777	908 J	806 J	729	787 J
Mercury	**0.1**	3.4	0.9 J	12.2 D	3.6 J	15.2 D	5.1 J	8.2 D	1.5 J	1.2	1 J	1.3 J	2.3	0.68 J
Nickel	13	92.9 J	----- R	189 J	----- R	413	----- R	263	----- R	125	----- R	----- R	98.8	----- R
Selenium	2.76	----- U	----- J	3.4 J	----- R	----- J	----- R	----- U	----- R	----- J	3.8 J	2.7 J	----- U	----- J
Thallium	1	----- U	2.2 J	----- U	4.1	----- U	4.8	----- U	3	----- U	2.5 J	2.7 J	----- U	2.3 J
Vanadium	**7.8**	56.1	38.5	111	82.9	170	54.6	256	31.3	57.3	47.9	45.9	55.4	31
Zinc	**20**	1940 J	521 J	7570 J	3610 J	6560	8320 J	6850	6790 J	3050	3600 J	3420 J	2710	489 J

Table 1
Process Area Soil Boring Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	PASS-13-S		PASB-13		PASS-14-D		PASB-14		PASS-15-D		PASS-15-D-Dup		PASB-15		PASS-16-S		PASB-16		PASS-17-D		PASB-17		PASS-18-D	
VOCs																									
m,p-Xylenes	5813	-----	UJ	-----	U	-----	UJ	-----		-----	UJ	-----	UJ	-----		-----	UJ	-----		-----	UJ	-----		-----	UJ
SVOCs																									
Phenol	145	-----	UJ	-----	U	-----	UJ	-----	U	-----	UJ	-----	UJ	-----	U	-----	UJ	-----	U	-----	UJ	-----	U	-----	UJ
Benzo(a)anthracene	**620**	670	J	1600	J	5100	J	-----	J	680	J	-----	J	-----	J	1100	J	6300		700	J	990		1400	J
Chrysene	1938	-----	J	1700	J	5700	J	-----	J	-----	J	-----	J	-----	J	-----	J	6200		-----	J	-----		1600	J
bis(2-Ethylhexyl) phthalate	35000	-----	J	-----	J	-----	J	-----		-----	J	-----	J	-----		-----	J	-----	U	-----	J	-----	U	-----	J
Benzo(b)fluoranthene	**620**	840	J	920	J	5200	J	-----	J	750	J	690	J	-----	U	1300	J	5000		740	J	900		1600	J
Benzo(k)fluoranthene	5329	-----	J	-----	J	4400	J	-----	J	-----	J	-----	J	-----	U	-----	J	-----		-----	J	-----		-----	J
Benzo(a)pyrene	**62**	900	J	1000	J	6000	J	500	J	870	J	740	J	440	J	1500	J	4100		870	J	890		1500	J
Indeno(1,2,3-cd)pyrene	**620**	-----	J	690	J	4100	J	-----	UJ	650	J	710	J	-----	UJ	1300	J	2300	J	790	J	-----		1200	J
Dibenz(a,h)anthracene	**62**	-----	UJ	-----	U	1300	J	-----	U	-----	UJ	-----	UJ	-----	U	320	J	530	J	-----	UJ	130	J	330	J
P/PCBs																									
Heptachlor	110	-----	J	-----	J	380	J	-----	U	-----	J	-----	J	-----		-----	J	-----	U	-----	J	-----	U	-----	J
Heptachlor epoxide	53	-----	R	-----	R	-----	UJ	-----	U	62	J	-----	R	-----	U	-----	R	-----	U	-----	R	-----	U	-----	UJ
Endrin	97	750	J	-----		1600	J	-----	J	620	J	630	J	-----		-----	J	-----	J	-----	UJ	-----	J	-----	J
4,4'-DDD	2400	-----	UJ	-----		-----	UJ	-----	J	-----	UJ	-----	UJ	-----	J	-----	UJ	-----	R	-----	UJ	-----		-----	UJ
4,4'-DDT	1700	-----	UJ	-----	U	-----	UJ	-----		-----	UJ	-----	UJ	-----	J	-----	UJ	-----	J	-----	J	-----	J	-----	J
Aroclor-1242	970	-----	UJ	-----	U	-----	UJ	3000		-----	UJ	-----	UJ	4100		-----	UJ	3300		-----	UJ	-----		-----	UJ
Aroclor-1248	970	-----	UJ	2000		19000	J	-----	U	8300	J	8300	J	-----	U	1600	J	-----	U	-----	J	-----	U	1200	J
Aroclor-1254	**110**	11000	J	3100		23000	J	2100		9300	J	9400	J	4200		3500	J	2500		460	J	340		1800	J
Aroclor-1260	970	-----	UJ	1200		9700	J	1100		2000	J	2000	J	3300	J	-----	J	1500		-----	J	-----	J	-----	J
Inorganics																									
Aluminum	7600	42300		34000	J	52400		8770	J	147000	D	124000	D	64400	J	42400		31900	J	67400		13700	J	50300	
Antimony	3.1	16.5		20	J	45.3		10.1	J	74.3	J	111	J	128	J	19		11.9	J	18.1		6.3	J	22.5	
Arsenic	**0.39**	8.4		25.9		16.2		19.5		19.5	J	12.5	J	36.3		7.8		15.7		8.8		8.4		9.7	
Barium	300	-----		956	J	-----		619	J	-----		-----		953	J	-----		-----	J	-----		-----	J	-----	
Beryllium	0.16	0.45	J	0.46	J	0.36	J	0.32	J	0.41	J	0.46	J	0.37	J	0.37	J	0.58		0.48	J	0.66		0.44	J
Cadmium	**1**	11.9		74.8	J	34.7		143	J	32		33.9		55.5	J	9.3		16.3	J	13.2		3.8	J	23.4	
Chromium	10	93.7		-----	R	152		-----	R	266		335		-----	R	132		-----	R	112		-----	R	125	
Copper	**25**	4190	D	1470	J	3710		640	J	7930	D	8410	D	6090	J	3100		3080	J	2660		566	J	3870	D
Iron	**2000**	30500	J	146001	J	77500	J	83700	J	46200	J	53100	J	131001	J	52800	J	62300	J	39000	J	38200	J	46000	J
Lead	**400**	1040		2970	J	2500		902	J	3450		4220		5190	J	1260		1210	J	1080		-----	J	1770	
Manganese	180	741		1290	J	845		594	J	1600		1330		1050	J	724		889	J	1090		589	J	798	
Mercury	**0.1**	1.4		2.1	J	8	D	0.7	J	3.8		2.8		2.8	J	1.4		1.5	J	3.6		1.1	J	2.2	
Nickel	13	75.1		-----	R	282		-----	R	265		196		-----	R	140		-----	R	98.8		-----	R	128	
Selenium	2.76	-----	U	-----	R	-----	J	-----	R	-----	U	-----	U	-----	R	-----	U	2.7	J	-----	U	-----	J	-----	U
Thallium	1	-----	U	5.8		-----	U	2.9		-----	U	-----	U	4.5		-----	U	3		-----	U	2	J	-----	U
Vanadium	**7.8**	32.7		34.3		107		58.2		92		77.2		53.9		51.6		51.3		39.9		23.4		46.9	
Zinc	**20**	1820		12700	J	5780		6430	J	6100		6220		25800	J	2480		3060	J	2080		370	J	2980	

Table 1
Process Area Soil Boring Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
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Chemical Name	SSSSC	PASB-18		PASB-18-DUP		PASS-19-D		PASB-19		PASS-20-D		PASS-20-D-Dup		PASB-20		PASS-21-D		PASB-21	
VOCs																			
m,p-Xylenes	5813	-----	J	-----		-----	UJ	8100		-----	UJ	-----	UJ	-----	U	-----	UJ	-----	
SVOCs																			
Phenol	145	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ
Benzo(a)anthracene	620	4500	J	3600	J	-----	J	1600	J	-----	J	2300	J	4600	J	1400	J	3100	J
Chrysene	1938	4800	J	3100	J	-----	J	1900	J	-----	J	2500	J	6800	J	1600	J	3300	J
bis(2-Ethylhexyl) phthalate	35000	-----		-----	J	-----	J	-----	J	-----	J	-----	J	-----	UJ	-----	J	-----	J
Benzo(b)fluoranthene	620	3800	J	3000	J	-----	J	1000	J	-----	J	2100	J	3700	J	1800	J	2400	J
Benzo(k)fluoranthene	5329	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	4100	J	-----	J	-----	J
Benzo(a)pyrene	62	3900	J	3100	J	430	J	1100	J	580	J	2300	J	4000	J	1700	J	2300	J
Indeno(1,2,3-cd)pyrene	620	2100	J	1600	J	-----	J	1000	J	-----	J	1300	J	2500	J	1400	J	1300	J
Dibenz(a,h)anthracene	62	600	J	510	J	-----	UJ	-----	UJ	-----	UJ	410	J	470	J	460	J	370	J
P/PCBs																			
Heptachlor	110	-----	U	-----	U	-----	UJ	-----	U	-----	J	-----	J	-----		-----	J	-----	U
Heptachlor epoxide	53	-----	U	-----	U	-----	R	-----	U	-----	R	-----	R	-----	J	-----	R	-----	R
Endrin	97	-----		-----	J	-----	J	-----	J	-----	J	-----	J	-----	U	-----	J	-----	
4,4'-DDD	2400	-----		-----	J	-----	UJ	-----	J	-----	UJ	-----	UJ	-----	J	-----	UJ	-----	
4,4'-DDT	1700	-----		-----	J	-----	J	-----		-----	J	-----	J	-----	J	-----	UJ	-----	
Aroclor-1242	970	-----	U	2300		-----	UJ	-----	U	-----	UJ	-----	UJ	-----		-----	UJ	-----	
Aroclor-1248	970	1300	J	-----	U	-----	J	1800		-----	J	-----	J	-----	U	3300	J	-----	U
Aroclor-1254	110	1700		2100		1300	J	1400		1100	J	950	J	140		4500	J	830	
Aroclor-1260	970	1300		1400	J	-----	J	-----		-----	J	-----	J	-----	U	-----	UJ	-----	
Inorganics																			
Aluminum	7600	19500	J	18300		146000	D	20400	J	45200		55000		13700		37800		19600	
Antimony	3.1	9	J	4.4	J	59.2		10.8	J	33.5		21.7		-----	J	22.1		4.1	J
Arsenic	0.39	13.5		-----	R	7.3		11.9		8.2		7.4		-----	R	9.3		-----	R
Barium	300	-----	J	-----		-----		-----	J	-----	J	-----	J	-----		-----		-----	
Beryllium	0.16	0.59		0.59		0.56	J	0.53	J	0.54	J	0.61		0.68		0.63		0.86	
Cadmium	1	21.4	J	17.7		17.7		12	J	60.5		50.9		3.3		15.7		6.8	
Chromium	10	-----	R	57.8		277		-----	R	104		95		19.8		129		38.6	
Copper	25	829	J	-----	R	11000	D	731	J	2050		2560		-----	R	2690		-----	R
Iron	2000	64700	J	61500		54800	J	71700	J	46200	J	39300	J	30000		50600	J	52200	
Lead	400	1520	J	-----	R	2480		782	J	1770		1010		-----	R	1370		-----	R
Manganese	180	669	J	697		1370		791	J	778		824		608		750		706	
Mercury	0.1	0.99	J	1.3		1		0.82	J	-----	R	-----	R	0.29		1.8		0.66	
Nickel	13	-----	R	89.7		229		-----	R	87.8		87.4		28.4		115		93.1	
Selenium	2.76	2.8	J	4.1		-----	U	3.4	J	-----	U	-----	J	-----	J	-----	U	2.8	J
Thallium	1	2.6	J	2.7	J	-----	U	3.3		-----	U	-----	U	1.7	J	-----	U	2.5	J
Vanadium	7.8	30.3		29.9		60		29.2		36.4		37.4		26.1		52.5		30.1	
Zinc	20	2120	J	2400		5230		2310	J	2650		2470		134		2360		1320	

Table 1
Process Area Soil Boring Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Notes:

Indicator contaminants are bolded

All VOC, SVOC, and P/PCB values are in micrograms per kilogram (ug/kg); inorganic values are in milligrams per kilogram (mg/kg)

Dup = duplicate

P/PCBs = pesticides and polychlorinated biphenyls

PASB = process area subsurface soil sample (2-4 feet below ground surface)

PASS = process area soil boring surface soil sample (S - 0-2 inches below ground surface; D - 0-12 inches below ground surface)

SSSSC = site-specific soil screening criteria

SVOCs = semivolatile organic compounds

VOCs = volatile organic compounds

A = Detected sample value is greater than the screening criteria value.

Dashed cells indicate that the value does not exceed the SSSSC -----

D = Compound is identified as a secondary dilution factor.

J = Value is estimated due to exceeded quality control criteria.

R = rejected sample from laboratory.

U = non-detected value.

Table 2
Site-Wide Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	SWSS-01-D	SWSB-01	SWSS-02-D	SWSB-02	SWSS-03-D	SWSB-03	SWSS-04-D	SWSB-04	SWSS-05-D	SWSB-05	SWSS-06-D	SWSB-06	SWSS-07-D
VOCs														
Benzene	291	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
m,p-Xylenes (total)	5813	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- J	-----	----- U	----- U	----- U
SVOCs														
Phenol	145	----- U	----- J	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Naphthalene	5600	----- J	-----	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- J	----- U	6300	----- U
Dimethylphthalate	9689	----- U	----- U	----- U	----- U	----- U	----- U	----- J	----- U	----- J	----- U	----- J	----- U	----- U
Phenanthrene	68892	-----	-----	----- U	----- J	----- J	----- J	----- U	----- J	----- J	----- J	-----	69000	----- J
Fluoranthene	68892	-----	-----	-----	----- J	-----	-----	----- J	----- J	-----	----- J	52000	70000	-----
Benzo(a)anthracene	**620**	-----	3700	1300	630 J	----- J	----- J	660 J	----- J	2800 J	850 J	19000	22000	1800 J
Chrysene	1938	-----	3500	-----	----- J	-----	-----	----- J	----- J	4300	----- J	15000	20000	2300
bis(2-Ethylhexyl) phthalate	35000	----- U	----- U	----- J	----- J	-----	----- U	----- J	----- U	----- U	----- U	----- J	----- J	-----
Benzo(b)fluoranthene	**620**	----- J	2500	1400	----- J	----- J	----- J	1500 J	----- J	3000 J	1100 J	11000	16000	1600 J
Benzo(k)fluoranthene	5329	-----	-----	-----	----- J	----- J	-----	----- J	----- J	----- J	----- J	10000	18000	----- J
Benzo(a)pyrene	**62**	610	2900	1100	660 J	240 J	320 J	1000 J	120 J	3600 J	1700 J	17000	21000	1600 J
Indeno(1,2,3-cd)pyrene	**620**	-----	1500	690	----- J	----- J	----- J	1400 J	----- J	3300 J	1200 J	8000	11000	1400 J
Dibenz(a,h)anthracene	**49**	120 J	520	200 J	----- U	51 J	60 J	----- U	----- U	810 J	----- U	3000	4300	340 J
P/PCBs														
Heptachlor	110	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- J	----- UJ	----- UJ
Heptachlor epoxide	53	----- R	----- UJ	----- R	----- R	----- UJ	----- UJ	----- R	----- UJ	----- R	----- UJ	----- R	----- R	----- R
Dieldrin	30	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ
Endrin	97	----- J	----- UJ	----- J	----- UJ	----- J	----- UJ	----- J	----- J	1200 J	----- J	----- J	----- J	----- J
Aroclor-1016	390	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ
Aroclor-1242	970	----- J	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	3400 J	----- UJ	----- UJ	----- UJ
Aroclor-1248	970	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	1200 J	----- J	17000 J	----- UJ	----- J	1400 J	3200 J
Aroclor-1254	**110**	470 J	----- UJ	360 J	200 J	----- J	----- UJ	3000 J	----- J	25000 J	2500 J	1600 J	1900 J	4200 J
Aroclor-1260	970	1800 J	----- UJ	----- J	----- J	----- UJ	----- UJ	1300 J	----- J	3800 J	----- J	1600 J	1800 J	1600 J
Inorganics														
Aluminum	7600	16000	15000	14400	14900	21100	17700	32200	14200	46400	20700	19900	21000	35000
Antimony	3.1	3.4 J	----- J	3.5 J	----- J	7 J	----- J	----- R	4.8 J	----- R	5.7 J	----- R	5.8 J	----- R
Arsenic	**0.39**	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R
Beryllium	0.16	0.66	0.73	0.61	0.71	0.68	0.75	0.68	0.58	0.66	0.83	0.65	1	0.61
Cadmium	**1**	10.6	1.2	4.5	3.6	31.7	-----	17.8	2	32.3	21.8	16	9.2	12.8
Chromium	10	48.1	20.2	31.4	28.4	51.2	20	137	25.8	187	51.1	96.6	59.6	89.2
Copper	**25**	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R
Iron	2000	73500	30400	31500	35300	45000	32200	66700	42500	110001	38800	70100	43900	61600
Lead	**400**	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R	----- R
Manganese	180	757	610	592	794	720	733	870	792	1140	763	966	1190	849
Mercury	**0.1**	2.4	4.3	1.5	0.3	2	0.23	2.6	0.79	4.3	1.3	3.2	4.2	2.7
Nickel	13	66.1	28	40.2	35.8	61.8	27.7	145	33.2	270	206	107	64	111
Selenium	2.76	5.1	2.1 J	4.4	----- J	2.3 J	----- U	4.8	----- J	7.9	6.4	3.6 J	2.8 J	3.9 J
Thallium	1	2.6 J	2.3 J	1.9 J	2.2 J	2.4 J	1.8 J	3.1	2.5 J	4.7	2.5 J	3.5	3.7	2.6 J
Vanadium	**8**	65.8	26.1	33.5	30.1	66	25.9	142	23	271	161	49.4	42.2	66.6
Zinc	20	3020	271	493	312	990	108	2650	404	7250	1620	1800	1380	2290

Table 2
Site-Wide Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	SWSB-07		SWSS-08-S		SWSB-08		SWSS-09-D		SWSB-09		SWSS-10-D		SWSB-10		SWSS-11-D		SWSB-11		SWSS-12-D		SWSB-12		SWSS-13-D	
VOCs																											
Benzene	291	-----	J	-----	U	-----		-----	J	-----		-----	U	-----	U	-----	U	-----		-----	U	-----		-----	U
m,p-Xylenes	5813	-----	U	-----		-----		-----	J	55000	J	-----	U	-----		-----	U	-----	J	-----	U	-----	J	-----	U
SVOCs																											
Phenol	145	-----	U	-----	U	-----	U	-----	UJ	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U
Naphthalene	5600	-----	U	-----	U	-----		-----	J	8000		-----	J	-----	J	-----	U	-----	J	-----	U	-----	J	-----	U
Dimethylphthalate	9689	-----	U	-----	J	-----	U	-----	UJ	-----	U	-----	U	-----	U	-----	U	-----	U	-----	J	-----	U	-----	U
Phenanthrene	68892	-----	J	-----	J	-----	J	-----	J	-----	J	-----		-----		-----	J	-----	J	-----	J	-----		-----	U
Fluoranthene	68892	-----		-----	J	-----	J	-----	J	-----	J	-----		-----		-----	J	-----	J	-----		-----		-----	J
Benzo(a)anthracene	**620**	-----	J	650	J	-----	J	-----	J	-----	J	3600		11000		930	J	-----	J	2000	J	3300	J	-----	U
Chrysene	1938	-----	J	-----	J	-----	J	-----	J	-----	J	4100		11000		-----	J	-----	J	2300		3400	J	-----	U
bis(2-Ethylhexyl) phthalate	35000	-----	U	-----		-----		-----	J	-----		-----	J	-----		-----		-----		-----		280000		-----	
Benzo(b)fluoranthene	**620**	-----	J	770	J	-----	J	990	J	-----	J	2800		6400		1000	J	-----	J	1900	J	2900	J	-----	J
Benzo(k)fluoranthene	5329	-----	J	-----	J	-----	J	-----	J	-----	J	-----		6200		-----	J	-----	J	-----	J	-----	J	-----	J
Benzo(a)pyrene	**62**	330	J	770	J	320	J	1100	J	610	J	3300		7200		1200	J	550	J	2200		3500	J	550	J
Indeno(1,2,3-cd)pyrene	**620**	-----	J	850	J	-----	J	1200	J	-----	J	2200		4200		1100	J	-----	J	2100		2100	J	-----	J
Dibenz(a,h)anthracene	**49**	-----	J	250	J	-----	U	280	J	-----	U	700	J	1200	J	260	J	-----	U	500	J	470	J	-----	U
P/PCBs																											
Heptachlor	110	-----	UJ	-----	J	-----	UJ	-----	UJ	-----	J	-----	J	-----	J	-----	J	120	J	-----	J	-----	J	-----	U
Heptachlor epoxide	53	-----	UJ	-----	R	81	J	-----	R	210	J	370	J	150	J	-----	R	110	J	-----	R	-----	R	-----	R
Dieldrin	30	-----	UJ	-----	UJ	56	J	-----	UJ	130	J	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	U	-----	U	-----	U
Endrin	97	-----	UJ	460	J	-----	UJ	-----	UJ	-----	J	510	J	-----	J	360	J	-----	J	1300	J	-----	R	-----	R
Aroclor-1016	390	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	U	-----	U	-----	U
Aroclor-1242	970	-----	UJ	-----	UJ	1600	J	-----	UJ	4000	J	-----	UJ	-----	UJ	-----	UJ	7300	J	-----	U	-----	U	-----	U
Aroclor-1248	970	-----	UJ	4600	J	-----	UJ	2600	J	-----	UJ	2200	J	2600	J	4900	J	-----	UJ	13000		5700		-----	U
Aroclor-1254	**110**	-----	UJ	6000	J	1400	J	3700	J	2900	J	6600	J	2500	J	4900	J	3800	J	18000		5800	J	9900	
Aroclor-1260	970	-----	UJ	1800	J	-----	J	2000	J	1600	J	1700	J	-----	J	6100	J	1600	J	-----	U	2600		2200	J
Inorganics																											
Aluminum	7600	9220		37500		14500		22500		14800		23600		17600		15300		14000		46800		26700		17600	
Antimony	3.1	-----	J	-----	R	128		-----	R	-----	UR	-----	UR	-----	UR	-----	R	-----	R	-----	R	-----	R	-----	R
Arsenic	**0.39**	-----	R	-----	R	-----	R	19.6		21		8.8		7.2		39.8		20.8		16.8		11.4		24.1	
Beryllium	0.16	0.51	J	0.51		0.63		0.88		0.77		0.68		0.54	J	0.47	J	0.51	J	0.55	J	0.42	J	0.55	J
Cadmium	**1**	1.3		14.3		58.3		18.6		32.2		7		3		16		12.9		21		11.1		16.3	
Chromium	10	15.1		110		25.9		72.6		32.4		60.7		37.6		99		70.3		147		71.6		99.1	
Copper	**25**	-----	R	-----	R	-----	R	869		1170		3040		413		765		550		2290		1420		539	
Iron	**2000**	23400		65600		36800		57700		61900		49200		37500		111999		83300		86200		62500		61700	
Lead	**400**	-----	R	-----	R	-----	R	4050	J	755	J	923	J	636	J	2900	J	3650	J	2520	J	1200	J	1300	J
Manganese	180	462		775		840		702		763		804		566		961		1390		1170		1160		1120	
Mercury	**0.1**	0.32		2.6		0.29		2.3		0.51		1.6		1.2		9.9		2.7		3.9		1.6		1.2	
Nickel	13	18.2		175		35.6		118		843		112		60.4		287		84.5		212		108		304	J
Selenium	2.76	-----	J	4.6		-----	J	5		13		4.7		2.5	J	11.2		27.1		7.5		6.1		5.7	
Thallium	1	1.6	J	2.3	J	2.2	J	2.4	J	2.8		2.4	J	1.3	J	3.7		4.1		3.8		3.1		3.4	
Vanadium	**8**	17.6		66.6		24.6		77.2		25.7		112		44.4		48.4		29		114		79.1		131	
Zinc	20	107		5500		402		4360	J	16200	J	1720	J	788	J	7880	J	2340	J	4990	J	2210	J	2350	J

Table 2
Site-Wide Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	SWSS-13-D-DUP		SWSB-13		SWSS-14-S		SWSB-14		SWSS-15-S		SWSB-15		SWSS-16-D		SWSB-16		SWSS-17-S		SWSB-17		SWSS-18-D		SWSB-18	
VOCs																									
Benzene	291	-----	UJ	-----		-----	U	-----	U	-----	U	280	J	-----	U	-----	U	-----	U	-----		-----		-----	U
m,p-Xylenes	5813	-----	UJ	-----		-----	U	-----	U	-----	U	-----		-----	U	-----	U	-----	U	-----		-----		-----	U
SVOCs																									
Phenol	145	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ
Naphthalene	5600	-----	UJ	7400	J	-----	UJ	-----	UJ	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	UJ
Dimethylphthalate	9689	-----	UJ	-----	UJ	-----	UJ	-----	UJ	17000	J	-----	UJ	-----	J	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ
Phenanthrene	68892	-----	J	59000	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	UJ
Fluoranthene	68892	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J
Benzo(a)anthracene	**620**	-----	J	24000	J	2800	J	4900	J	4200	J	3500	J	25000	J	2100	J	1900	J	1400	J	2500	J	-----	J
Chrysene	1938	-----	J	24000	J	2800	J	4700	J	4900	J	3700	J	23000	J	2100	J	2100	J	1700	J	2800	J	-----	J
bis(2-Ethylhexyl) phthalate	35000	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J
Benzo(b)fluoranthene	**620**	1100	J	12000	J	3000	J	5700	J	3800	J	2800	J	22000	J	1800	J	2900	J	1200	J	2400	J	-----	J
Benzo(k)fluoranthene	5329	-----	J	12000	J	-----	J	-----	J	-----	J	-----	J	17000	J	-----	J	-----	J	-----	J	-----	J	-----	J
Benzo(a)pyrene	**62**	1300	J	22000	J	3000	J	5100	J	4300	J	2800	J	19000	J	2000	J	2200	J	1100	J	2200	J	500	J
Indeno(1,2,3-cd)pyrene	**620**	1200	J	8500	J	2000	J	2900	J	3700	J	1900	J	10000	J	1100	J	1800	J	800	J	1300	J	-----	UJ
Dibenz(a,h)anthracene	**49**	-----	UJ	2800	J	510	J	800	J	740	J	620	J	3100	J	380	J	660	J	-----	UJ	370	J	-----	UJ
P/PCBs																									
Heptachlor	110	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	UJ	-----	U	-----	J	-----	J
Heptachlor epoxide	53	-----	R	-----	R	-----	R	-----	R	-----	R	-----	R	-----	R	-----	J	-----	R	-----	U	-----	R	-----	R
Dieldrin	30	-----	UJ	81	J	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	U	-----	U	-----	U
Endrin	97	-----	UJ	-----	J	-----	J	-----	R	400	J	-----	UJ	380	J	-----	J	-----	R	-----	J	-----	J	-----	
Aroclor-1016	390	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	U	-----	U	-----	U
Aroclor-1242	970	-----	UJ	1300	J	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	J	-----	UJ	1700		-----	U	-----	U
Aroclor-1248	970	1800	J	-----	UJ	1600	J	2100	J	2400	J	1300	J	1700	J	-----	UJ	2900		-----	U	-----	J	-----	
Aroclor-1254	**110**	3000	J	1700	J	3400	J	2700	J	5000	J	1500	J	2400	J	170	J	4100		1900		510		280	J
Aroclor-1260	970	1800	J	1100	J	1200	J	-----	J	1700	J	-----	J	1900	J	-----	J	1300	J	1400		-----	U	-----	
Inorganics																									
Aluminum	7600	18000		16300		26800		21200		28500		16300		25400		17300		91400		19600		21000	J	17100	J
Antimony	3.1	-----	UR	-----	UR	-----	UR	-----	UR	-----	UR	-----	UR	-----	UR	-----	UR	-----	R	-----	UR	-----	J	-----	J
Arsenic	**0.39**	22		8.1		16.5		10		10.8		5.9		14.6		9.7		9.1		13.5		5.1		4.8	
Beryllium	0.16	0.64		0.65		0.67		0.62		0.59		0.45	J	0.87		0.93		0.64		0.7		0.81	J	0.58	J
Cadmium	**1**	11.1		7.6		12.7		5.8		9.8		3.4		10.9		-----	J	11.7		7.2		2		1.3	
Chromium	10	50.7		30.1		72.7		53.2		94.7		32.5		80.2		40.2		126		50		30.9	J	27.3	J
Copper	**25**	513		399		1040		769		1230		451		833		134		6850		651		291	J	262	J
Iron	**2000**	61100		37100		73300		44300		66600		36200		86300		88900		74200		47800		31100		23400	
Lead	**400**	1560	J	446	J	1310	J	888	J	1560	J	743	J	976	J	-----	J	6790	J	2360	J	445		-----	
Manganese	180	1080		697		1170		836		855		494		934		1310		969		761		696		589	
Mercury	**0.1**	2.1		0.41		1.7		0.98		1.7		0.72		1.3		0.25		1.8		0.85		1.1	J	0.23	J
Nickel	13	109	J	48.4		119		85.1		152		44.5		105		44.7		209		71.9		37.4		25.1	
Selenium	2.76	4.8		3.4	J	5.8		3.9		6.2		2.7	J	7.7		7.7		6.7		4.6		2.1	J	-----	U
Thallium	1	3.2		1.7	J	3.6		2.1	J	2.7		1.6	J	3.3		4.1		2.5	J	2.1	J	2.2	J	1.9	J
Vanadium	**8**	115		57.6		107		80		116		42.5		86.4		32.3		87.7		44.5		38.5		35.3	
Zinc	20	2090	J	1900	J	2130	J	1670	J	2420	J	1100	J	1640	J	183	J	4940	J	2340	J	466	J	274	J

Table 2
Site-Wide Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	SWSS-19-D		SWSB-19		SWSS-20-S		SWSB-20		SWSS-21-D		SWSB-21		SWSB-21-DUP		SWSS-22-D		SWSB-22		SWSS-23-D		SWSB-23		SWSS-24-D		SWSB-24	
VOCs																											
Benzene	291	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	J	-----	U	-----		-----	UJ	-----	U
m,p-Xylenes	5813	-----	U	-----	U	-----	UJ	-----	U	-----	U	-----	J	-----	U	-----	U	-----	U	-----	U	-----	J	-----	UJ	-----	J
SVOCs																											
Phenol	145	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	UJ
Naphthalene	5600	-----	UJ	-----	J	-----	UJ	-----	J	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	J	-----	UJ	-----	UJ	-----	UJ	-----	J
Dimethylphthalate	9689	-----	UJ	-----	UJ	-----	UJ	-----	UJ	-----	J	-----	UJ	-----	UJ	-----	J	-----	UJ	-----	J	-----	UJ	-----	J	-----	UJ
Phenanthrene	68892	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J
Fluoranthene	68892	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J
Benzo(a)anthracene	**620**	4300	J	1000	J	-----	J	4700	J	2500	J	-----	J	830	J	1900	J	4000	J	2000	J	-----	J	8300	J	5900	J
Chrysene.	1938	4200	J	-----	J	-----	J	4100	J	2200	J	-----	J	-----	J	2000	J	4300	J	2000	J	-----	J	6800	J	5400	J
bis(2-Ethylhexyl) phthalate	35000	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J
Benzo(b)fluoranthene	**620**	3700	J	980	J	-----	J	4400	J	1800	J	-----	J	980	J	1600	J	4400	J	2400	J	-----	J	5200	J	5300	J
Benzo(k)fluoranthene	5329	4000	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	-----	J	4200	J	-----	J	-----	J	4200	J	4000	J
Benzo(a)pyrene	**62**	2900	J	840	J	480	J	3200	J	1900	J	400	J	750	J	1600	J	3500	J	2000	J	320	J	3900	J	5000	J
Indeno(1,2,3-cd)pyrene	**620**	1500	J	-----	J	-----	J	2300	J	1400	J	-----	J	-----	J	1700	J	2600	J	2000	J	-----	J	2800	J	3300	J
Dibenz(a,h)anthracene	**49**	550	J	130	J	-----	UJ	580	J	400	J	-----	UJ	-----	UJ	-----	UJ	1200	J	510	J	-----	J	930	J	910	J
P/PCBs																											
Heptachlor	110	-----	J	-----	U	-----	U	-----	U	-----	J	-----	J	-----	J	-----	J	-----	U	-----	J	-----	J	-----	J	-----	
Heptachlor epoxide	53	-----	R	-----	R	-----	R	-----	U	-----	R	-----	R	-----	R	-----	R	-----	U	-----	U	-----	R	-----	R	-----	R
Dieldrin	30	-----	UJ	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	190	J	-----	U	-----	U	-----	U	-----	U
Endrin	97	-----	R	-----	U	-----	J	-----	J	-----	J	-----	U	-----	J	-----	R	440	J	360		-----	U	-----	J	-----	J
Aroclor-1016	390	-----	UJ	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U
Aroclor-1242	970	-----	UJ	-----	U	-----	U	1400		-----	U	-----	U	-----	U	-----	U	4500		-----	U	-----	U	-----	U	-----	U
Aroclor-1248	970	2100		-----		1900		-----	U	1100		-----		-----		2800		-----	U	3100		-----	J	2600		1500	
Aroclor-1254	**110**	3000		260	J	2100		1300	J	1200	J	380	J	600	J	4300		5100		5400		300	J	4000		1300	J
Aroclor-1260	970	-----	J	-----		-----	J	-----		-----		-----		-----		1600	J	7900		1100	J	-----	J	1500	J	-----	
Inorganics																											
Aluminum	7600	21700	J	18700	J	31500	J	10600	J	55700	J	24000	J	42900	J	64300	J	47900	J	43100	J	24000	J	28600	J	21700	J
Antimony	3.1	5.6	J	-----	J	10.5	J	293	J	7.1	J	5.2	J	5.8	J	8.5	J	10.8	J	9.8	J	-----	J	10.4	J	4.2	J
Arsenic	0.39	13		8.1		11.6		73.1		7		8.3		9.1		9.4		8.9		11.6		6.3		14.2		8.2	
Beryllium	0.16	0.76	J	0.85	J	0.61	J	0.59	J	0.71	J	0.83	J	0.81	J	1.7	J	0.76	J	0.66	J	1.3	J	0.6	J	0.84	J
Cadmium	1	7.9		2.3		17.7		13.2		9.5		4		7.9		13.6		9.1		19.2		1.6		17.2		3.4	
Chromium	10	106	J	38.7	J	96.6	J	65.4	J	121	J	46.7	J	77	J	124	J	95.4	J	113	J	34	J	106	J	38	J
Copper	25	667	J	192	J	2150	J	432	J	4740	J	480	J	1770	J	3110	J	2890	J	2850	J	141	J	1490	J	334	J
Iron	2000	108999		82000		68400		36500		53800		38500		45900		75100		45600		78300		45900		111000		45200	
Lead	400	1160		1050		2320		9970		1280		581		988		2160		1390		5490		-----		15900		703	
Manganese	180	1180		860		768		645		737		801		901		1610		790		911		746		961		773	
Mercury	0.1	1.6	J	0.31	J	1.4	J	0.76	J	1.8	J	0.45	J	0.93	J	2.5	J	1.5	J	3.1	J	0.14	J	2.1	J	1.4	J
Nickel	13	122		55.6		112		55.9		133		45.5		77.1		160		98.5		194		49.4		162		45.1	
Selenium	2.76	9.2		5.3		5.8		4.1		4.3		2.7	J	3.1	J	6.4		4	J	7.2		2.9	J	10.1		2.5	J
Thallium	1	3.7		2.7		2.5	J	2.3	J	2.4	J	1.9	J	2.7	J	4.1		1.9	J	3.4		2.3	J	3.8		1.9	J
Vanadium	8	97.5		34.5		51.6		22.4		81.1		34.9		55.3		105		65.6		226		46.3		103		38.7	
Zinc	20	1300	J	291	J	2060	J	633	J	3060	J	647	J	1870	J	3210	J	1960	J	3470	J	475	J	2580	J	719	J

Table 2
Site-Wide Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	SWSS-25-D	SWSB-25	SWSS-26-S	SWSB-26	SWSS-27-D	SWSB-27	SWSS-28-D	SWSB-28	SWSS-29-D	SWSB-29	SWSS-30-S	SWSB-30	SWSS-31-D
VOCs														
Benzene	291	----- U	----- U	----- U	----- J	----- U	----- J	----- U	----- U	----- U	----- U	----- U	----- U	----- U
m,p-Xylenes	5813	----- U	----- U	----- U	-----	----- U	19000	----- J	----- U	----- U	----- U	----- U	----- U	----- U
SVOCs														
Phenol	145	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Naphthalene	5600	----- U	----- J	----- U	13000	----- J	10000	----- U	----- U	----- U	----- U	----- J	----- J	----- U
Dimethylphthalate	9689	-----	----- U	----- U	----- U	----- J	----- U	----- J	----- U	----- U	----- U	----- U	----- U	----- U
Phenanthrene	68892	-----	-----	-----	81000	-----	-----	-----	----- J	-----	-----	-----	-----	----- J
Fluoranthene	68892	-----	----- J	-----	-----	-----	-----	-----	----- J	-----	-----	-----	-----	-----
Benzo(a)anthracene	**620**	660	1000 J	1900	7500	2400	2200	1800	----- J	1200	-----	1600	-----	----- J
Chrysene	1938	-----	----- J	2100	6800	2400	2500	1900	----- J	1500	-----	1700	-----	----- J
bis(2-Ethylhexyl) phthalate	35000	-----	-----	-----	-----	-----	-----	-----	----- J	-----	-----	-----	----- J	-----
Benzo(b)fluoranthene	**620**	1300	950 J	1800	3500 J	4300	3000	2700	----- J	1400	-----	1500	-----	730 J
Benzo(k)fluoranthene	5329	----- U	----- J	-----	----- J	----- U	-----	-----	----- J	-----	----- J	-----	-----	----- J
Benzo(a)pyrene	**62**	710	890 J	2000	3000 J	2700	2800	2600	250 J	1600	470	1600	460	830
Indeno(1,2,3-cd)pyrene	**620**	----- J	----- U	1200 J	1200 J	1300	1400 J	1500	----- U	1700 J	----- J	1400 J	----- J	890 J
Dibenz(a,h)anthracene	**49**	91 J	----- U	420 J	----- U	400 J	520 J	470 J	76 J	620	120 J	370	73 J	190 J
P/PCBs														
Heptachlor	110	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- UJ	-----	----- UJ	----- U	----- R	----- U
Heptachlor epoxide	53	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- UJ	----- U	----- UJ	----- U	----- R	----- U
Dieldrin	30	----- U	----- J	----- U	----- U	----- U	----- U	----- U	----- UJ	----- U	----- UJ	----- U	----- R	----- U
Endrin	97	----- U	----- J	----- U	----- U	----- U	----- U	----- U	----- UJ	----- U	----- UJ	----- U	----- R	----- U
Aroclor-1016	390	----- U	----- U	----- U	----- U	----- U	2200	----- U	----- UJ	----- U	----- UJ	----- U	----- R	----- U
Aroclor-1242	970	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- UJ	----- U	----- UJ	----- U	----- R	----- U
Aroclor-1248	970	----- U	----- U	----- U	2300 J	2800	----- U	3000	----- UJ	----- J	----- UJ	----- J	----- R	----- U
Aroclor-1254	**110**	5100	1000 J	1300	2000	3300	3300	3800	----- J	540 J	----- J	1000	----- R	1500
Aroclor-1260	970	----- U	----- U	-----	1200	1600	-----	1300 J	----- UJ	----- J	----- J	----- J	----- R	-----
Inorganics														
Aluminum	7600	18000	12000	23000	89000	32000	28000	27000	15000	25000	-----	21000	14000	32000
Antimony	3.1	----- U	----- U	15	52	34	15	19	----- U	17	11	11	----- U	19
Arsenic	**0.39**	7	6.7	13	16	13	11	12	5.4	11	19	8.6	7.4	9.2
Beryllium	0.16	0.59	0.58	----- U	----- U	----- U	0.57	----- U	0.57	----- U	----- U	0.6	0.59	----- U
Cadmium	**1**	6.1	2.3	12	21	13	6.9	11	1.3	12	9.2	5.8	-----	7.4
Chromium	10	40	22	83	230	89	79	91	26	64	39	50	28	73
Copper	**25**	620	190	1300	5300	3100	1400	1300	310	1300	340	720	220	3400
Iron	**2000**	52000	32000	110000	78000	110000	49000	80000	38000	57000	45000	53000	36000	76000
Lead	**400**	770	550	3700	3200	5400	1300	2900	500	2200	1100	1500	-----	3900
Manganese	180	790	760	920	1200	1100	880	970	740	720	350	780	740	930
Mercury	**0.1**	0.8	0.34	1.3	0.88	2.4	1.3	2.7	0.33	2.6	1.2	1.6	0.35	1.9
Nickel	13	72	47	170	2600	4600	150	210	48	120	49	75	34	170
Selenium	2.76	4.2	----- U	6.5	5.8	7.9	----- U	5.7	----- U	4.8	4.5	4.2	----- U	5.8
Thallium	1	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Vanadium	**8**	36	22	97	140	120	380	150	36	89	23	63	22	170
Zinc	**20**	970	370	3500	4400	5200	1800	3100	630	2400	1100	1900	400	3700

Table 2
Site-Wide Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	SWSB-31	SWSB-31-Dup	SWSS-32-D	SWSB-32	SWSS-33-D	SWSB-33	SWSS-34-S	SWSB-34	SWSS-35-D	SWSS-35-D-Dup	SWSB-35
VOCs												
Benzene	291	----- U	----- J	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
m,p-Xylenes	5813	-----	-----	----- U	----- U	----- U	----- J	----- U	----- U	----- U	----- U	----- U
SVOCs												
Phenol	145	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Naphthalene	5600	----- J	----- J	-----	----- U	----- J	----- J	----- J	----- J	-----	----- J	----- U
Dimethylphthalate	9689	----- U	----- U	----- J	----- U	----- J	----- U	----- J	----- U	-----	-----	----- U
Phenanthrene	68892	----- J	----- J	-----	-----	-----	-----	-----	-----	-----	-----	-----
Fluoranthene	68892	----- J	----- J	----- J	-----	-----	-----	-----	-----	-----	-----	-----
Benzo(a)anthracene	**620**	----- U	----- U	1300	990 J	1900	1500	2800	1100	6000	4600	1000
Chrysene	1938	----- U	----- U	1500	----- J	2100	1600	3800	-----	6900	5200	-----
bis(2-Ethylhexyl) phthalate	35000	-----	-----	37000	-----	-----	-----	-----	----- U	-----	-----	-----
Benzo(b)fluoranthene	**620**	----- U	----- U	1800	1100 J	3200	1300	4300	880	7200	5900	1200
Benzo(k)fluoranthene	5329	----- U	----- U	-----	----- J	-----	-----	-----	-----	4100	-----	-----
Benzo(a)pyrene	**62**	----- U	----- U	1600	1200	2300	1400	3800	1000	7600	5500	1200
Indeno(1,2,3-cd)pyrene	**620**	----- UJ	----- UJ	1100 J	1000 J	2100	990	2100	730	5100	4000	820
Dibenz(a,h)anthracene	**49**	----- UJ	----- UJ	300 J	----- UJ	550	310 J	620	220 J	1400	1100	230 J
P/PCBs												
Heptachlor	110	----- U	----- UJ	----- J	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Heptachlor epoxide	53	----- U	----- UJ	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Dieldrin	30	----- U	----- UJ	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Endrin	97	----- U	----- UJ	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Aroclor-1016	390	----- U	----- UJ	----- U	----- U	-----	----- U	----- U	----- U	1200	1500	----- U
Aroclor-1242	970	----- U	----- UJ	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Aroclor-1248	970	----- U	----- UJ	----- U	----- U	----- U	----- U	1500 J	----- U	----- U	----- U	----- U
Aroclor-1254	**110**	1200	----- J	3100	3100	2500	150	4500	----- J	6900	9400	----- U
Aroclor-1260	970	-----	----- UJ	----- U	----- U	-----	----- U	1100	----- U	----- U	2100 J	----- U
Inorganics												
Aluminum	7600	14000	14000	25000	28000	27000	12000	26000	13000	29000	37000	11000
Antimony	3.1	12	9	40	21	26	----- U	20	----- U	30	33	----- U
Arsenic	**0.39**	10	10	12	11	11	5.9	12	6.2	15	16	4.1
Beryllium	0.16	----- U	----- U	----- U	----- U	----- U	0.64	----- U	0.63	----- U	----- U	----- U
Cadmium	**1**	4.2	3.5	9.9	9	12	----- U	9.9	-----	20	23	-----
Chromium	10	61	59	86	81	90	18	91	20	120	120	17
Copper	**25**	900	480	1500	1400	1600	86	1300	89	1700	3200	53
Iron	**2000**	80000	94000	89000	63000	100000	28000	82000	39000	68000	110000	26000
Lead	**400**	8300	8900	8100	3400	9300	-----	4100	-----	2600	3300	-----
Manganese	180	850	840	900	820	1100	630	920	590	900	1100	580
Mercury	**0.1**	0.69	0.64	2.4	3.6	2.5	0.8	2.7	0.14	3.9	3.2	0.57
Nickel	13	120	95	180	490	180	27	160	31	190	190	24
Selenium	2.76	4.8	5.3	5.5	4.3	11	----- U	5.5	----- U	----- U	5.3	----- U
Thallium	1	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U	----- U
Vanadium	**8**	250	180	150	220	160	18	160	24	180	230	19
Zinc	**20**	4600	3400	3900	3100	4800	230	3200	240	4000	6800	200

Table 2
Site-Wide Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSSC	SWSS-36-D		SWSB-36		SWSS-37-D		SWSB-37	
VOCs									
Benzene	291	-----	U	-----	U	-----	U	-----	U
m,p-Xylenes	5813	-----	J	-----	J	-----	J	-----	J
SVOCs									
Phenol	145	-----	U	1600		-----	U	-----	U
Naphthalene	5600	-----	U	-----		-----	U	-----	J
Dimethylphthalate	9689	-----	U	-----		-----	J	-----	U
Phenanthrene	68892	-----		-----		-----		-----	
Fluoranthene	68892	-----		-----		-----		-----	
Benzo(a)anthracene	**620**	6600		20000		2300		3300	
Chrysene	1938	7500		20000		2700		3700	
bis(2-Ethylhexyl) phthalate	35000	-----		-----		-----		-----	
Benzo(b)fluoranthene	**620**	5600		19000		3100		6400	
Benzo(k)fluoranthene	5329	3900		15000		-----		-----	U
Benzo(a)pyrene	**62**	5700		22000		3000		4600	
Indeno(1,2,3-cd)pyrene	**620**	3300		15000		2400		2900	
Dibenz(a,h)anthracene	**49**	950	J	3300		600	J	780	J
P/PCBs									
Heptachlor	110	-----	U	-----	U	-----	U	-----	U
Heptachlor epoxide	53	-----	U	-----	U	-----	U	-----	U
Dieldrin	30	-----	U	-----	U	-----	U	-----	U
Endrin	97	-----	U	-----	U	-----	U	-----	U
Aroclor-1016	390	-----		470		-----	J	510	
Aroclor-1242	970	-----	U	-----	U	-----	U	-----	U
Aroclor-1248	970	-----	U	-----	U	-----	U	-----	U
Aroclor-1254	**110**	4300		3400	J	4600	J	4500	J
Aroclor-1260	970	-----		-----	J	1300		1200	
Inorganics									
Aluminum	7600	22000		24000		26000		23000	
Antimony	3.1	12		16		16		30	
Arsenic	**0.39**	12		11		13		10	
Beryllium	0.16	-----	U	-----	U	0.55		-----	U
Cadmium	**1**	11		9.6		12		9.6	
Chromium	10	56		79		64		56	
Copper	**25**	930		1200		1200		1100	
Iron	**2000**	51000		57000		48000		46000	
Lead	**400**	1200		1500		1500		2100	
Manganese	180	880		850		860		800	
Mercury	**0.1**	1.7		1.8		2.3		-----	U
Nickel	13	92		130		160		120	
Selenium	2.76	-----	U	4.7		-----	U	-----	U
Thallium	1	-----	U	-----	U	-----	U	-----	U
Vanadium	**8**	92		200		760		170	
Zinc	20	2600		2200		2500		2300	

Table 2
Site-Wide Surface and Subsurface Soil Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Notes:
Indicator contaminants are bolded.
All VOC, SVOC, and P/PCB values are in micrograms per kilogram (ug/kg); inorganic values are in milligrams per kilogram (mg/kg)
Dup = duplicate
P/PCBs = pesticides and polychlorinated biphenyls
SWSB = site-wide soil boring subsurface soil sample (2-4 feet below ground surface)
SWSS = site-wide soil boring surface soil sample (S - 0-2 inches below ground surface; D - 0-12 inches below ground surface)
SSSSC = site-specific soil screening criteria
SVOCs = semivolatile organic compounds
VOCs = volatile organic compounds
Dashed cells indicate that the value does not exceed the SSSSC
J = Value is estimated due to exceeded quality control criteria.
R = rejected sample from laboratory.
U = non-detected value.

Table 3
Sediment Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSDSC	SD-11	SD-12	SD-13	SD-14	SD-15	SD-16	SD-16-Dup	SD-17	SD-18	SD-19	SD-20
SVOCs												
4-Methylphenol	20	70 J	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- U	----- UJ	----- U	----- UJ
Fluorene	319	370 J	----- J	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- J	----- J	4800	350 J
Phenanthrene	1170	3200 J	----- J	----- J	----- J	----- J	----- J	----- J	2400	1900 J	28000	5000 J
Anthracene	845	----- J	----- J	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- J	----- J	8300	970 J
Fluoranthene	2230	6200 J	----- J	----- J	----- J	----- J	----- J	----- J	4500	3000 J	40000	8700 J
Naphthalene	1196	----- J	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- U	----- J	1300 J	----- UJ
Pyrene	1520	3900 J	----- J	----- J	----- J	----- J	----- J	----- J	5700	2800 J	40000	6900 J
Benzo(a)anthracene	**52**	**2900 J**	**710 J**	**160 J**	**280 J**	**180 J**	**300 J**	**340 J**	**2700**	**1300 J**	**16000**	**3900 J**
Chrysene	52	3500 J	840 J	200 J	350 J	250 J	400 J	390 J	3000	1600 J	16000	4300 J
Benzo(b)fluoranthene	**52**	**4100 J**	**870 J**	**270 J**	**370 J**	**330 J**	**500 J**	**410 J**	**3000**	**1700 J**	**15000**	**4800 J**
Benzo(k)fluoranthene	**52**	**1600 J**	**370 J**	**96 J**	**160 J**	**----- UJ**	**170 J**	**170 J**	**1000**	**700 J**	**5900**	**1800 J**
Benzo(a)pyrene	**52**	**3400 J**	**670 J**	**190 J**	**290 J**	**240 J**	**340 J**	**300 J**	**2200**	**1400 J**	**12000**	**3900 J**
Indeno(1,2,3-cd)pyrene	**52**	**3000 J**	**490 J**	**110 J**	**180 J**	**120 J**	**180 J**	**220 J**	**1700**	**1100 J**	**7700**	**3800 J**
Dibenz(a,h)anthracene	**211**	**850 J**	**----- J**	**----- UJ**	**----- UJ**	**----- UJ**	**----- UJ**	**----- UJ**	**470 J**	**410 J**	**2400 J**	**780 J**
P/PCBs												
4,4'-DDE	0.3985	12 J	6.1 J	7.3 J	4.7 J	5.9 J	6.3 J	7 J	9.8 J	6.5 J	3.5 J	**4.5** J
4,4'-DDD	0.3985	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	11	----- UJ	3.3 J	----- UJ
Aroclor-1248	0.03188	520 J	----- R	220 J	----- R	----- R	260 J	290 J	----- R	230 J	----- U	----- UJ
Inorganics												
Antimony	2	----- U	15 J	----- UJ	----- UJ	----- UJ	----- UJ	----- UJ	----- U	----- UJ	----- U	----- U
Arsenic	**6**	**-----**	**----- J**	**----- J**	**----- J**	**----- J**	**----- J**	**----- J**	**14**	**----- J**	**-----**	**-----**
Cadmium	**0.6**	**1.4**	**----- UJ**	**----- UJ**	**----- UJ**	**----- UJ**	**----- UJ**	**----- UJ**	**1.7**	**----- UJ**	**----- U**	**----- U**
Chromium	26	42	51 J	64 J	60 J	55 J	69 J	63 J	86	59 J	-----	31
Copper	**16**	**340**	**82 J**	**70 J**	**69 J**	**59 J**	**82 J**	**73 J**	**2600**	**74 J**	**36**	**95**
Iron	**20000**	**27000**	**29000 J**	**35000 J**	**35000 J**	**30000 J**	**38000 J**	**34000 J**	**69000**	**34000 J**	**32000**	**25000**
Lead	**31**	**360**	**78 J**	**71 J**	**69 J**	**60 J**	**83 J**	**72 J**	**400**	**77 J**	**67**	**340**
Manganese	460	610	1400 J	1800 J	1700 J	1700 J	1900 J	1900 J	1300	1700 J	540	-----
Nickel	16	36	30 J	37 J	35 J	31 J	39 J	36 J	86	34 J	21	33
Silver	1	----- UJ	----- UJ	3.4 J	----- UJ	3 J	7.2 J	5 J	2.3	----- UJ	----- U	----- U
Zinc	**120**	**450**	**190 J**	**200 J**	**200 J**	**170 J**	**230 J**	**210 J**	**1100**	**210 J**	**160**	**420**

Notes:

Indicator Contaminants are bolded
VOCs = volatile organic compounds
SVOCs = semivolatile organic compounds
P/PCBs = pesticides and polychlorinated biphenyls
SSSDSC = site-specific sediment screening criteria

U = non-detected value.
J = Value is estimated due to exceeded quality control criteria.
R = rejected sample from laboratory.
Dup = duplicate

All VOC, SVOC, and P/PCB values are in micrograms per kilogram (ug/kg); inorganic values are in milligrams per kilogram (mg/kg)
Dashed cells indicate that the value does not exceed the SSSDSC

Table 4
Surface Water Screening Criteria Exceedances
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	SSSWSC	SW-11	SW-12	SW-13	SW-14	SW-15	SW-16	SW-16-Dup	SW-17	SW-18	SW-19	SW-20
Inorganics												
Aluminum	87	290	200	350	460	610	390	430	320	320	470	440
Iron	**300**	**360**	**-----**	**440**	**600**	**740**	**500**	**520**	**490**	**430**	**600**	**520**
Lead	3	----- U	12	----- U	10	----- U	----- U	----- U	----- U	----- U	----- U	----- U

Notes:
Indicator contaminants are bolded.
All values are in micrograms per liter (ug/L)
Dup = duplicate
SSSWC = site-specific surface water screening criteria
SW = surface water
Dashed cells indicate that the value does not exceed the SSSWSC
U = non-detected value.

Table 5
Groundwater Monitoring Well Screening Criteria Exceedances - Round 1 and Round 2
Consolidated Iron and Metal Superfund Site
Newburgh, New York

ROUND 1

Chemical Name	SSGWSC	MW-09-R1 (background)		MW-01-R1		MW-02-R1		MW-03-R1		MW-04-R1		MW-05-R1		MW-05-R1-Dup		MW-06-R1		MW-07-R1		MW-08-R1	
VOCs																					
Methyl tert-butyl ether	10	-----	U	-----	U	-----		-----		14		14		11		-----		19		15	
Benzene	1	9.6		-----	U	-----	U	-----	J	3.8		18		15		-----	U	-----	U	-----	J
Toluene	5	-----	J	-----	J	-----	J	-----		-----		9.8		9.7		-----	U	-----	U	-----	J
Ethylbenzene	5	-----	U	-----		-----	U	-----	J	-----		62		61		-----	U	-----	U	-----	J
m,p-Xylenes	5	-----	U	-----		-----	U	-----		6.6		260		250		-----	U	-----	U	-----	
INORGANICS																					
Iron	**300**	**590**		**4500**		**42000**		**26000**		**30000**		**70000**		**69000**		**14000**		**19000**		**5900**	
Lead	**15**	**-----**	U	**-----**	U	**-----**	U	**38**		**-----**	U	**91**		**89**		**-----**	U	**-----**	U	**-----**	
Magnesium	35000	-----		-----		-----		47000		47000		67000		67000		-----		37000		-----	
Manganese	300	890		3100		2200		1400		1200		1500		1500		1100		670		380	
Sodium	20000	80000		84000		93000		45000		110000		150000		150000		50000		70000		30000	
Zinc	**5**	**-----**	U	**-----**	U	**-----**	U	**-----**	U	**-----**	U	**150**		**140**		**-----**	U	**-----**	U	**-----**	U

ROUND 2

Chemical Name	SSGWSC	MW-09-R2 (background)		MW-01-R2		MW-02-R2		MW-03-R2		MW-04-R2		MW-05-R2		MW-05-R2-Dup		MW-06-R2		MW-07-R2		MW-08-R2	
VOCs																					
Methyl tert-butyl ether	10	-----	J	-----	U	-----	J	16		47	J	-----	J	-----		-----		26		14	
Benzene	1	13		-----	J	-----	U	-----	J	1.9	J	4.9		4.4		-----	U	-----	U	-----	J
Ethylbenzene	5	-----	U	-----		-----	U	-----	U	-----		19		17		-----	U	-----	U	-----	J
m,p-Xylenes	5	-----	U	-----	J	-----	U	-----	J	-----		61		65		-----	U	-----	U	-----	
INORGANICS																					
Antimony	3	-----	U	-----	U	-----	U	33.4	J	-----	U	-----	U	-----	U	-----	U	-----	U	-----	U
Iron	**300**	**773**		**5550**		**50200**		**37600**		**29000**		**87200**		**84400**		**19600**		**20800**		**10900**	
Magnesium	35000	-----		-----		46200		54800		55500		89800		87300		-----		39000		-----	
Manganese	300	954		2730		2430		1700		1250		1890		1840		1640		668		488	
Sodium	20000	83900	J	78300	J	105000	J	43700	J	114999	J	200001	J	192000	J	47400	J	69200	J	29200	J
Thallium	0.5	7.1	J	5.9	J	6.3	J	4.6	J	6.2	J	8.9	J	5.9	J	-----	U	5.1	J	6.2	J
Zinc	**5**	**-----**	R	**26.4**	J	**25.6**	J	**-----**	R	**33.1**	J	**98.8**		**97.8**		**26.2**	J	**46.7**	J	**105**	

Notes:
Indicator contaminants are bolded
All values are in micrograms per liter (ug/L)
Dashed cells indicate that the value does not exceed the SSGWSC ----
SSGWSC = site-specific groundwater screening criteria

R1 = round 1 groundwater sampling event
R2 = round 2 groundwater sampling event
VOCs = volatile organic compounds
U = non-detected value.

J = value is estimated due to exceeded quality control criteria
R = data was rejected

TABLE 6

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concen-tration Units	Frequency of Detection	Exposure Point Concen-tration	Exposure Point Concen-tration	Statistical Measure
		Min	Max					
Surface Soil	Benzo(a)anthracene	2.5e-01	2.5e+01	mg/kg	58/58	4.3e+00	mg/kg	95% H-UCL
	Benzo(a)pyrene	2.4e-01	2.3e+01	mg/kg	58/58	4.4e+00	mg/kg	95% H-UCL
	Benzo(b)fluoranthene	2.3e-01	2.2e+01	mg/kg	58/58	4.4e+00	mg/kg	95% H-UCL
	Dibenzo(a,h)anthracene	5.1e-02	5.5e+00	mg/kg	50/58	1.1e+00	mg/kg	95% G-UCL
	Indeno(1,2,3-cd)pyrene	1.8e-01	1.7e+01	mg/kg	58/58	3.1e+00	mg/kg	95% H-UCL
	Aroclor 1242	1.1e-01	3.8e+01	mg/kg	5/58	1.3e+01	mg/kg	99% Cheb
	Aroclor 1248	1.7e-01	3.7e+01	mg/kg	42/58	1.3e+01	mg/kg	99% Cheb
	Aroclor 1254	7.0e-02	3.5e+01	mg/kg	58/58	1.4e+01	mg/kg	97.5% Cheb
	Aroclor 1260	1.6e-01	9.7e+00	mg/kg	47/58	3.3e+00	mg/kg	97.5% Cheb
	Lead	4.5e+02	1.6e+04	mg/kg	50/50	3.2e+03	mg/kg	Average

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Concern	Concen-tration Detected		Concen-tration Units	Frequency of Detection	Exposure Point Concen-tration	Exposure Point Concen-tration	Statistical Measure
		Min	Max					
Subsurface Soil	Aroclor 1242	1.2e-01	5.4e+01	mg/kg	24/57	1.5e+01	mg/kg	99% Cheb
	Aroclor 1248	7.0e-02	5.7e+00	mg/kg	18/57	1.3e+00	mg/kg	97.5% Cheb
	Aroclor 1254	5.2e-02	2.7e+01	mg/kg	53/57	3.2e+00	mg/kg	95% G-UCL
	Aroclor 1260	1.1e-01	1.5e+01	mg/kg	46/57	1.9e+00	mg/kg	95% G-UCL
	Lead	1.3e+02	1.0e+04	mg/kg	48/48	1.7e+03	mg/kg	Average

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concen-tration Detected		Concen-tration Units	Frequency of Detection	Exposure Point Concen-tration	Exposure Point Concen-tration	Statistical Measure
		Min	Max					
Tap Water	Benzene	1.4e-01	1.7e+01	ug/L	9/16	1.2e+01	ug/L	99% Cheb
	Lead	1.4e+01	9.0e+01	ug/L	3/8	9.0e+01	ug/L	MAX

Key

mg/kg: milligram per kilogram; parts per million
95% H-UCL: Lognormal Distribution, Upper Confidence Limit
95% G-UCL: Gamma Distribution, Upper Confidence Limit
99% Cheb: 99% Chebyshev (Mean, Std), Upper Confidence Limit
97.5% Cheb: 97.5% Chebyshev (Mean, Std), Upper Confidence Limit
MAX: Maximum detected concentration, less than 10 samples

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

The tables present the chemicals of concern (COCs) and exposure point concentration for each of the COCs detected in the surface and subsurface soil and groundwater(*i.e.,* the concentrations that will be used to estimate the exposure and risk from each COC in each media). The tables include the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the exposure point concentration (EPC), and how the EPC was calculated.

TABLE 7
Selection of Exposure Pathways
Conceptual Site Model

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Rationale for Selection/Exclusion of Exposure Pathway
Current/ Future	Surface Soil	Surface Soil	Surface Soil	Trespasser	Adolescent (12-18 yrs)	Ingestion Dermal	Onsite	Trespassers could cross the fence and be exposed to onsite surface soil.
		Air	Air	Trespasser	Adolescent (12-18 yrs)	Inhalation	Onsite	Trespassers may inhale fugitive dust and volatile chemicals from surface soil.
	Sediment	Sediment	Hudson River	Recreational User	Adult	Ingestion Dermal	Offsite	Waders in the river may have exposed skin surfaces come into contact with sediment or may incidentally ingest sediment.
					Adolescent (12-18 yrs)	Ingestion Dermal	Offsite	
	Surface Water	Surface Water	Hudson River	Recreational User	Adult	Ingestion Dermal	Offsite	Waders in the river may have exposed skin surfaces come into contact with surface water or may incidentally ingest surface water. Concentrations detected in surface water did not exceed screening levels, so no chemicals of concern are associated with this medium.
					Adolescent (12-18 yrs)	Ingestion Dermal	Offsite	
Future	Surface Soil	Surface Soil	Surface Soil	Site Worker	Adult	Ingestion Dermal	Onsite	If the site is redeveloped in the future, onsite residents, site workers, or onsite recreational users could be exposed to surface soil.
				Onsite Resident	Adult	Ingestion Dermal	Onsite	
					Child (0-6 yrs)	Ingestion Dermal	Onsite	
				Onsite Recreational User	Adult	Ingestion Dermal	Onsite	
					Child (0-6 yrs)	Ingestion Dermal	Onsite	

		Air	Air	Site Worker	Adult	Inhalation	Onsite	Site workers, onsite residents, and onsite recreational users may inhale fugitive dust and volatile chemicals from surface soil
				Onsite Resident	Adult	Inhalation	Onsite	
					Child (0-6 yrs)	Inhalation	Onsite	
				Onsite Recreational User	Adult	Inhalation	Onsite	
					Child (0-6 yrs)	Inhalation	Onsite	
	Surface and Subsurface Soil	Surface and Subsurface Soil	Surface and Subsurface Soil	Construction Worker	Adult	Ingestion Dermal	Onsite	If the site is developed in the future, construction workers could be exposed during excavation and construction.
		Air	Air	Construction Worker	Adult	Inhalation	Onsite	Construction workers may inhale fugitive dust and volatile chemicals in from surface and subsurface soil.
	Groundwater	Groundwater	Tap Water	Onsite Resident	Adult	Ingestion Dermal	Onsite	Private wells could be installed in the future for onsite residents or site workers using the groundwater supply.
					Child (0-6 yrs)	Ingestion Dermal	Onsite	
				Site Worker	Adult	Ingestion	Onsite	
		Air	Water Vapors at Showerhead	Onsite Resident	Adult	Inhalation	Onsite	
					Child (0-6 yrs)	Inhalation	Onsite	
			Vapors from Subsurface Intrusion	Site Worker	Adult	Inhalation	Onsite	If the site is redeveloped in the future, site workers and onsite residents could be exposed to volatile chemicals migration from groundwater to indoor air.
				Onsite Resident	Adult	Inhalation	Onsite	
					Child (0-6 yrs)	Inhalation	Onsite	

Summary of Selection of Exposure Pathways

The table presents all exposure pathways considered for the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 8

Non-Cancer Toxicity Data Summary

Pathway: Ingestion/Dermal									
Chemical of Concern	Chronic/ Sub-chronic	Oral RfD Value	Oral RfD Units	Dermal RfD	Dermal RfD units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Benzene	Chronic	4.0e-03	mg/kg-day	4.0e-03	mg/kg-day	Blood	300	IRIS	7/12/2005
Benzo(a)anthracene*	Chronic	3.0e-02	mg/kg-day	3.0e-02	mg/kg-day	Kidney	3000	IRIS	7/12/2005
Benzo(a)pyrene*	Chronic	3.0e-02	mg/kg-day	3.0e-02	mg/kg-day	Kidney	3000	IRIS	7/12/2005
Benzo(b)fluoranthene*	Chronic	3.0e-02	mg/kg-day	3.0e-02	mg/kg-day	Kidney	3000	IRIS	7/12/2005
Dibenzo(a,h)anthracene*	Chronic	3.0e-02	mg/kg-day	3.0e-02	mg/kg-day	Kidney	3000	IRIS	7/12/2005
Indeno(1,2,3-cd)pyrene*	Chronic	3.0e-02	mg/kg-day	3.0e-02	mg/kg-day	Kidney	3000	IRIS	7/12/2005
Aroclor 1242†	Chronic	2.0e-05	mg/kg-day	2.0e-05	mg/kg-day	Eye/Skin/Nails	300	IRIS	1/6/2005
Aroclor 1248†	Chronic	2.0e-05	mg/kg-day	2.0e-05	mg/kg-day	Eye/Skin/Nails	300	IRIS	1/6/2005
Aroclor 1254†	Chronic	2.0e-05	mg/kg-day	2.0e-05	mg/kg-day	Eye/Skin/Nails	300	IRIS	1/6/2005
Aroclor 1260†	Chronic	2.0e-05	mg/kg-day	2.0e-05	mg/kg-day	Eye/Skin/Nails	300	IRIS	1/6/2005
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Pathway: Inhalation									
Chemical of Concern	Chronic/ Subchronic	Inhalation RfC Value	Inhalation RfC Units	Inhalation RfD	Inhalation RfD units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfC/RfD: Target Organ	Dates:
Benzene	Chronic	3.0e-02	mg/m3	6.6e-03	mg/kg-day	Blood	300	IRIS	7/12/2005
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA

KEY

NA: No information available

IRIS: Integrated Risk Information System, U.S. EPA

* : RfD for pyrene used as a surrogate

† : RfD for Aroclor-1254 used as a surrogate

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs).

TABLE 9

Cancer Toxicity Data Summary

Pathway: Ingestion, Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Benzene	5.5e-02	1/(mg/kg-day)	5.5e-02	1/(mg/kg-day)	A	IRIS	7/12/2005
Benzo(a)anthracene	7.3e-01	1/(mg/kg-day)	8.2e-01	1/(mg/kg-day)	B2	NCEA	1/24/2003
Benzo(a)pyrene	7.3e+00	1/(mg/kg-day)	8.2e+00	1/(mg/kg-day)	B2	IRIS	1/6/2005
Benzo(b)fluoranthene	7.3e-01	1/(mg/kg-day)	8.2e-01	1/(mg/kg-day)	B2	NCEA	1/24/2003
Dibenzo(a,h)anthracene	7.3e+00	1/(mg/kg-day)	8.2e+00	1/(mg/kg-day)	B2	NCEA	1/24/2003
Indeno(1,2,3-cd)pyrene	7.3e-01	1/(mg/kg-day)	8.2e-01	1/(mg/kg-day)	B2	NCEA	1/24/2003
Aroclor 1242	2.0e+00	1/(mg/kg-day)	2.0e+00	1/(mg/kg-day)	B2	IRIS	1/6/2005
Aroclor 1248	2.0e+00	1/(mg/kg-day)	2.0e+00	1/(mg/kg-day)	B2	IRIS	1/6/2005
Aroclor 1254	2.0e+00	1/(mg/kg-day)	2.0e+00	1/(mg/kg-day)	B2	IRIS	1/6/2005
Aroclor 1260	2.0e+00	1/(mg/kg-day)	2.0e+00	1/(mg/kg-day)	B2	IRIS	1/6/2005
Lead	N/A	N/A	N/A	N/A	B2	IRIS	1/6/2005

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Benzene	7.8e-06	1/(ug/m^3)	2.7e-02	1/(mg/kg-day)	A	IRIS	7/12/2005
Benzo(a)anthracene	NA	1/(ug/m^3)	3.1e-01	1/(mg/kg-day)	B2	NCEA	1/24/2003
Benzo(a)pyrene	8.9e-04	1/(ug/m^3)	3.1e+00	1/(mg/kg-day)	B2	NCEA	1/22/2003
Benzo(b)fluoranthene	NA	1/(ug/m^3)	3.1e-01	1/(mg/kg-day)	B2	NCEA	1/24/2003
Dibenzo(a,h)anthracene	NA	1/(ug/m^3)	3.1e+00	1/(mg/kg-day)	B2	NCEA	1/24/2003
Indeno(1,2,3-cd)pyrene	NA	1/(ug/m^3)	3.1e-01	1/(mg/kg-day)	B2	NCEA	1/24/2003
Aroclor 1242	NA	1/(ug/m^3)	2.0e+00	1/(mg/kg-day)	B2	IRIS	1/6/2005
Aroclor 1248	NA	1/(ug/m^3)	2.0e+00	1/(mg/kg-day)	B2	IRIS	1/6/2005
Aroclor 1254	NA	1/(ug/m^3)	2.0e+00	1/(mg/kg-day)	B2	IRIS	1/6/2005
Aroclor 1260	NA	1/(ug/m^3)	2.0e+00	1/(mg/kg-day)	B2	IRIS	1/6/2005
Lead	NA	NA	NA	NA	B2	IRIS	1/6/2005

Key:

NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA
NCEA: National Center for Environmental Assessment, U.S. EPA

EPA Group:

A - Human carcinogen
B1 - Probable Human Carcinogen-Indicates that limited human data are available
B2 - Probable Human Carcinogen-Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 10

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Benzo(a)anthracene	1.1e-06	1.2e-08	9.4e-07	2.1e-06
			Benzo(a)pyrene	1.1e-05	4.8e-08	9.6e-06	2.1e-05
			Benzo(b)fluoranthene	1.1e-06	2.6e-08	9.6e-07	2.1e-06
			Dibenzo(a,h)anthracene	2.7e-06	2.8e-09	2.3e-06	5.1e-06
			Indeno(1,2,3-cd)pyrene	8.0e-07	6.9e-07	6.9e-07	1.5e-06
			Aroclor 1242	9.2e-06	4.1e-09	8.5e-06	1.8e-05
			Aroclor 1248	9.0e-06	4.0e-09	8.3e-06	1.7e-05
			Aroclor 1254	9.6e-06	4.2e-09	8.8e-06	1.8e-05
			Aroclor 1260	2.3e-06	1.0e-09	2.1e-06	4.4e-06
						Soil Risk =	1.0e-04
Groundwater	Groundwater	Tap Water	Benzene	2.30e-06	6.90e-07	NA	3.0e-06
						Groundwater Risk =	3.0e-05
						Total Risk =	2.0e-04

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Aroclor 1242	4.9e-07	6.5e-11	2.0e-07	6.9e-07
			Aroclor 1248	4.7e-07	6.4e-11	2.0e-07	6.7e-07
			Aroclor 1254	5.0e-07	6.8e-11	2.1e-07	7.2e-07
						Surface Soil Risk =	5.0e-06
Subsurface Soil	Subsurface Soil	Subsurface Soil	Aroclor 1242	5.50e-07	7.30e-11	2.3e-07	7.8e-07
						Subsurface Soil Risk =	3.0e-06
						Total Risk =	8.0e-06

Scenario Timeframe: Future
Receptor Population: Onsite Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total

Surface Soil	Surface Soil	Surface Soil	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260	1.5e-06 1.5e-05 1.5e-06 3.7e-06 1.1e-06 1.2e-05 1.2e-05 1.3e-05 3.0e-06	1.7e-08 6.5e-08 3.4e-08 3.7e-09 2.0e-09 5.5e-09 5.3e-09 5.7e-09 1.4e-09	7.7e-07 7.8e-06 7.8e-07 1.9e-06 5.6e-07 6.9e-06 6.7e-09 7.2e-06 1.7e-06	2.3e-06 2.3e-05 3.2e-06 5.6e-06 1.6e-06 1.9e-05 1.9e-05 2.0e-05 4.8e-06
						Soil Risk =	1.0e-04
Groundwater	Groundwater	Tap Water	Benzene	6.30e-06	5.30e-06	2.1e-07	1.2e-05
						Groundwater Risk =	9.0e-05
						Total Risk =	2.0e-04

Scenario Timeframe: Future
Receptor Population: Onsite Resident
Receptor Age: Child (0-6 yrs)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260	3.5e-06 3.5e-05 3.5e-06 8.6e-06 2.5e-06 2.9e-05 2.8e-05 3.0e-05 7.1e-06	1.2e-08 4.5e-08 2.4e-08 2.6e-09 1.4e-09 3.8e-09 3.7e-09 4.0e-09 2.8e-06	1.3e-06 1.3e-05 1.3e-06 3.1e-06 9.1e-07 1.1e-05 1.1e-05 1.2e-05 2.8e-06	4.7e-06 4.8e-05 4.8e-06 1.2e-05 3.4e-06 4.0e-05 3.9e-05 4.2e-05 9.9e-06
						Soil Risk =	3.0e-04
Groundwater	Groundwater	Tap Water	Benzene	3.70e-06	6.40e-06	1.6e-07	1.0e-05
						Groundwater Risk =	6.0e-05
						Total Risk =	4.0e-04

Key

NA : Route of exposure is not applicable to this medium or was not quantitatively evaluated.

Summary of Risk Characterization - Carcinogens

The table presents risk estimates for the significant routes of exposure. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of the receptors exposure to soil and groundwater, as well as the toxicity of the COCs.

TABLE 11

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Aroclor 1242	Eye/Skin/Nails	6.4e-01	NA	5.9e-01	1.2e+00
			Aroclor 1248	Eye/Skin/Nails	6.3e-01	NA	5.8e-01	1.2e+00
			Aroclor 1254	Eye/Skin/Nails	6.7e-01	NA	6.2e-01	1.3e+00
							Total Receptor Hazard Index =	8.0e+00
							Total Skin HI =	4.0e+00
							Total Eye HI =	4.0e+00
							Total Nail HI =	4.0e+00

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Aroclor 1242	Eye/Skin/Nails	8.5e-01	NA	3.6e-01	1.2e+00
			Aroclor 1248	Eye/Skin/Nails	8.5e-01	NA	3.6e-01	1.2e+00
			Aroclor 1254	Eye/Skin/Nails	8.5e-01	NA	3.6e-01	1.2e+00
							Surface Soil Hazard Index =	5.5e+00
Subsurface Soil	Subsurface Soil	Subsurface Soil	Aroclor 1242	Eye/Skin/Nails	9.6e-01	NA	4.0e-01	1.4e+00
							Subsurface Soil Hazard Index =	3.5e+00
							Total Receptor Hazard Index =	9.0e+00
							Total Skin HI =	6.0e+00
							Total Eye HI =	6.0e+00
							Total Nail HI =	6.0e+00

Scenario Timeframe: Future
Receptor Population: Onsite Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation*	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Aroclor 1242	Eye/Skin/Nails	9.0e-01	NA	5.0e-01	1.4e+00
			Aroclor 1248	Eye/Skin/Nails	8.8e-01	NA	4.9e-01	1.4e+00
			Aroclor 1254	Eye/Skin/Nails	9.4e-01	NA	5.2e-01	1.5e+00
			Aroclor 1260	Eye/Skin/Nails	2.2e-01	NA	1.2e-01	3.5e-01
							Total Receptor Hazard Index =	1.4e+01
							Total Eye HI =	5.0e+00
							Total Skin HI =	5.0e+00
							Total Nail HI =	5.0e+00

Scenario Timeframe: Future
Receptor Population: Onsite Resident
Receptor Age: Child (0-6 yrs)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation*	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Surface Soil	Aroclor 1242	Eye/Skin/Nails	8.4e+00	NA	3.3e+00	1.2e+01
			Aroclor 1248	Eye/Skin/Nails	8.2e+00	NA	3.2e+00	1.1e+01
			Aroclor 1254	Eye/Skin/Nails	8.7e+00	NA	3.4e+00	1.2e+01
			Aroclor 1260	Eye/Skin/Nails	2.1e+00	NA	8.1e-01	2.9e+00
							Total Receptor Hazard Index =	7.3e+01
							Total Eye HI =	3.8e+01
							Total Skin HI =	4.1e+01
							Total Nail HI =	3.8e+01

Key

NA : Route of exposure is not applicable to this medium or was not quantitatively evaluated.

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

Table 12
Refinement of Ecological Chemicals of Potential Concern
Sediment
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Location of Maximum Concentration	Detection Frequency	Background [1]	Ecological Screening Level Value [2]		Mean Concentration	HQ based on Mean	COPC	Justification and comments	HQ based on Background	(HQ) - (HQ Background)
Volatile Organic Compounds (µg/kg)													
Acetone	21	120	SD-17	8 / 10	40.5	0.3	c	44.5	131.1	No	not assoicated with site operation and not detected in soil	119.3	11.8
2-Butanone	8 J	26	SD-17	4 / 10	8.6	10.1	c	10.6	1.0	No	HQ ⊴	--	--
Semi-volatile Organic Compounds (µg/kg)													
Acenaphthene	94 J	4700	SD-19	6 / 10	2,072.0	5,222.0	e	775.4	0.1	No	HQ ⊴	--	--
Acenaphthylene	110 J	240 J	SD-20	3 / 10	502.0	6.0	h	523.5	87.7	No	not assoicated with site operation and not detected in soil	84.1	3.6
Anthracene	220 J	8300	SD-19	6 / 10	2,579.0	13,801.0	a	1,315.0	0.1	No	HQ ⊴	--	--
Benzaldehyde	91 J	210 J	SD-18	7 / 10	ND	NV	--	410.4	--	No	not assoicated with site operation and not site related	--	--
Benzo(a)anthracene	160 J	16000	SD-19	10 / 10	2,431.2	55,204.0	a	2,843.0	0.1	No	HQ ⊴	--	--
Benzo(a)pyrene	190 J	12000	SD-19	10 / 10	1,814.9	53,712.0	a	2,463.0	0.05	No	HQ ⊴	--	--
Benzo(b)fluoranthene	270 J	15000	SD-19	10 / 10	2,061.0	387.9	l	3,094.0	8.0	Yes		5.3	2.7
Benzo(g,h,i)perylene	95 J	4700	SD-19	10 / 10	918.4	11,936.0	a	1,117.5	0.1	No	HQ ⊴	--	--
Benzo(k)fluoranthene	96 J	5900	SD-19	9 / 10	951.5	49,982.0	a	1,225.6	0.02	No	HQ ⊴	--	--
bis(2-Ethylhexyl) phthalate	1900	7200 J	SD-11	3 / 10	5,591.0	7,441.4	e	1,715.0	0.2	No	HQ ⊴	--	--
Butylbenzylphthalate	120 J	1200 J	SD-19	5 / 10	774.5	406.6	d	564.0	1.4	No	not assoicated with site operation and not site related	--	--
Carbazole	210 J	2700 J	SD-19	5 / 10	494.5	NV	--	623.5	--	No	not assoicated with site operation and not site related	--	--
Chrysene	200 J	16000	SD-19	10 / 10	2,649.0	17,158.0	a	3,044.0	0.2	No	HQ ⊴	--	--
Dibenzo(a,h)anthracene	150 J	2400 J	SD-19	6 / 10	616.0	4,849.0	a	696.0	0.1	No	HQ ⊴	--	--
Dibenzofuran	79 J	1900 J	SD-19	4 / 10	1,247.0	15.7	c	425.4	27.2	No	below background	79.6	-52.4
Dimethylphthalate	470 J	470 J	SD-11	1 / 10	780.5	11.9	i	629.5	53.1	No	below background	65.8	-12.7
Di-n-butylphthalate	110 J	11000 J	SD-20	3 / 10	616.5	8,952.0	c	1,567.5	0.2	No	HQ ⊴	--	--
Di-n-octylphthalate	71 J	510 J	SD-11	4 / 10	ND	1,790.4	j	518.6	0.3	No	HQ ⊴	--	--
Fluoranthene	270 J	40000	SD-19	10 / 10	5,046.0	38,046.0	a	6,527.0	0.2	No	HQ ⊴	--	--
Fluorene	100 J	4800	SD-19	6 / 10	1,799.0	5,968.0	a	793.0	0.1	No	HQ ⊴	--	--
Indeno(1,2,3-cd)pyrene	110 J	7700	SD-19	10 / 10	1,027.2	11,936.0	a	1,838.0	0.2	No	HQ ⊴	--	--
2-Methylnaphthalene	98 J	770 J	SD-19	3 / 10	595.5	25.0	b	441.3	17.7	No	below background	23.8	-6.2
4-Methylphenol	70 J	70 J	SD-11	1 / 10	ND	25.0	j	589.5	23.6	No	not assoicated with site operation and not detected in soil	--	--
Naphthalene	160 J	1300 J	SD-19	3 / 10	865.5	1,119.0	e	510.5	0.5	No	HQ ⊴	--	--
Phenanthrene	140 J	28000	SD-19	10 / 10	5,950.5	35,435.0	a	4,214.0	0.1	No	HQ ⊴	--	--
Pyrene	300 J	40000	SD-19	10 / 10	4,823.0	31,705.0	a	6,253.0	0.2	No	HQ ⊴	--	--

Table 12
Refinement of Ecological Chemicals of Potential Concern
Sediment
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Location of Maximum Concentration	Detection Frequency	Background [1]	Ecological Screening Level Value[2]		Mean Concentration	HQ based on Mean	COPC	Justification and comments	HQ based on Background	(HQ) - (HQ Background)
Pesticides and Polychlorinated biphenyls (µg/kg)													
4,4'-DDD	3.3 J	11	SD-17	2 / 10	4.4	223.8	a	4.8	0.02	No	HQ ⊴	--	--
4,4'-DDE	3.5 J	12 J	SD-11	10 / 10	6.0	708.7	a	6.7	0.01	No	HQ ⊴	--	--
Endrin aldehyde	3.2 J	8.4 JN	SD-17	3 / 10	ND	17.9	i	4.9	0.3	No	HQ ⊴	--	--
Endrin ketone	6.2 JN	6.2 JN	SD-20	1 / 9	6.3	NV	--	4.4	--	No	not assoicated with site operation and not site related	--	--
Aroclor-1248	220 J	520 J	SD-11	4 / 6	223.3	5,595.0	a	219.5	0.04	No	HQ ⊴	--	--
Inorganics (mg/kg)													
Aluminum	8500	18000	SD-17	10 / 10	14,000.0	14,000.0	g	13,950.0	1.0	No	HQ ⊴	--	--
Antimony	15 J	15 J	SD-12	1 / 10	11.5	25.0	b	7.8	0.3	No	HQ ⊴	--	--
Arsenic	1.5	14	SD-17	10 / 10	5.8	33.0	a	5.5	0.2	No	HQ ⊴	--	--
Barium	47	380	SD-20	10 / 10	119.1	160.0	f	124.0	0.8	No	HQ ⊴	--	--
Cadmium	1.4	1.7	SD-17	2 / 10	0.9	10.0	a	0.9	0.1	No	HQ ⊴	--	--
Chromium	18	86	SD-17	10 / 10	54.8	145.0	b	53.5	0.4	No	HQ ⊴	--	--
Cobalt	9.2	18 J	SD-16	10 / 10	16.0	50.0	i	14.0	0.3	No	HQ ⊴	--	--
Copper	36	2600	SD-17	10 / 10	71.5	110.0	a	350.7	3.2	Yes		0.7	2.5
Cyanide	0.28 J	0.66 J	SD-16	4 / 10	2.8	0.1	d	2.2	22.0	No	below background	27.9	-5.9
Iron	25000	69000	SD-17	10 / 10	31,700.0	40,000.0	a	35,400.0	0.9	No	HQ ⊴	--	--
Lead	60 J	400	SD-17	10 / 10	70.3	250.0	a	160.5	0.6	No	HQ ⊴	--	--
Manganese	370	1900 J	SD-16	10 / 10	1,671.0	1,100.0	a	1,302.0	1.2	No	not assoicated with site operation and not site related	--	--
Mercury	0.17	0.54	SD-11	10 / 10	0.3245	2.0	a	0.4	0.2	No	HQ ⊴	--	--
Nickel	21	86	SD-17	10 / 10	33.1	75.0	a	38.2	0.5	No	HQ ⊴	--	--
Selenium	8.9 J	8.9 J	SD-12	1 / 10	6.6	2.0	d	4.5	2.3	No	not assoicated with site operation and not site related	--	--
Silver	2.3	7.2 J	SD-16	4 / 10	ND	2.2	b	2.5	1.1	No	not assoicated with site operation and not site related	--	--
Thallium	6.4 J	6.4 J	SD-12	1 / 10	4.7	NV	--	3.3	--	No	not assoicated with site operation and not site related	--	--
Vanadium	15	31 J	SD-16	10 / 10	26.1	NV	--	25.5	--	No	below background (25.5 vs. 26.1)	--	--
Zinc	160	1100	SD-17	10 / 10	180.0	270.0	b	333.0	1.2	No	not assoicated with site operation and not site related	--	--

Table 12
Refinement of Ecological Chemicals of Potential Concern
Sediment
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Location of Maximum Concentration	Detection Frequency	Background [1]	Ecological Screening Level Value[2]	Mean Concentration	HQ based on Mean	COPC	Justification and comments	HQ based on Background	(HQ) - (HQ Background)

[1] Background values were calculated by averaging the values from samples (SD-01 through SD-10), including one half detection limits for non-detects

[2] for organics, screening criteria are based on a calculated site-specific average total organic carbon concentration of 3.73%

Sources

a Persaud D, R. Jaagumagi, and A. Hayton 1993. Guidelines for the protection and management of aquatic sediment quality in Ontario Water Resources Branch, Ontario Ministry of the Emvironment, Toronto, 27 pp.

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d. EPA Region 3. 2005. BTAG Freshwater Sediment Screening Benchmarks, March 2005

e. NYSDEC Technical Guidance for Screening Contaminated Sediments, 1999

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h. NOAA Squirt 1999.

i. EPA Region 5, 2003. RCRA Ecological Screening Levels, July 17, 2003

j. Washington MAEL (minor adverse effect level), Washington Department of Ecology, Sediment Management Unit, Sediment Quality Chemical Criteria updated 8/9/2001, http://www.ecy.wa.gov/programs/tcp/smu/sed_chem.htm

Definitions:

NV = No Value
NA = Not Applicable
ND = Not detected
J = Estimated Value
JN = Tentatively Identified
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram

Table 13
Surface Soil PRGs
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	NYSDEC RSCO [1]	Site-Specific Impact to Groundwater	Human Health Risk-Based PRGs (1×10^{-6}, HQ=1)[+]	Site-Specific Background Value - Surface Soil			CRQLs for Analytical Method [4]	Site Detection Range	Detection Frequency	PRG Exceedence	PRG	
				Maximum	95% UPL (with outliers)	95% UPL (without outliers)					Value	Source
Semi-volatile Organic Compound [a,b] (µg/kg)												
Benzo(a)anthracene	788	-	620	5,000	3,590 [2]	1,463	330	260 - 25,000	58/58	38/58	1,463	SB
Benzo(a)pyrene*	214	-	62	3,800	2,816 [2]	1,266	330	240-23,000	58/58	43/58	1,266	SB
Benzo(b)fluoranthene	3868	-	620	5,100	4,956	1,300	330	230-22,000	58/58	44/58	1,300	SB
Dibenzo(a,h)anthracene	49	-	62	1,300	1,300	1,000	330	51-5,500	50/58	9/58	1,000	SB
Indeno(1,2,3-cd)pyrene	11251	-	620	3,000	2,086 [2]	894	330	180-17,000	58/58	45/58	894	SB
Pesticide/Polychlorinated biphenyl (µg/kg)												
Aroclor-1254*	1,000 [c]	-	221	170	105 [3]	40 [3]	33	70 - 35,000	58/58	51/58	1,000	NYSDEC
Inorganic Compound (mg/kg)												
Arsenic*	7.5 or SB	6.2	0.4	9.2	9.2	NA	3	5.1 - 39.8	50/50	37/50	9.2	SB
Cadmium	1 or SB	430	129	3.1	3.1	1.4	1	2 - 96.5	58/58	0/58	129	HHRA
Copper	25 or SB	910	10,950	193	193	38.0	5	291-11,000	50/50	0/50	3,129	HHRA
Iron	2,000 or SB	150	NL	38,300	38,300	25,519	20	30,500-127,000	58/58	58/58	25,519	SB
Lead**	SB	270	400 [d]	503	503	379	2	445 - 15,900	50/50	50/50	400	HHRA
Mercury	0.1	8	27	0.99	0.98	NA	0.1	0.8-15.29	57/57	0/57	27	HHRA
Vanadium	150 or SB	NL	1,916	30.8	31.0	NA	10	32.7-760	58/58	0/58	1,916	HHRA
Zinc	20 or SB	53,000	82,125	266.0	266.0	182.0	12	466-10,900	58/58	0/58	82,125	HHRA

Notes:

[+] based on age-adjusted residential scenario

* risk driver in the medium

** no toxicity values for risk calculation, but most prevalent and a COPC in all media, except surface water

CRQL - contract required quantitation limit

NA =not available

HHRA = human-health risk-based

PRG = preliminary remedial goal

UPL = upper prediction limit

NYSDEC RSCO = New York State Department of Environmental Conservation Recommended Soil Cleanup Objectives

SB = site background

NA = no outliers identified

NL = no toxicity value

µg/kg = micrograms per kilogram

[1] NYSDEC Soil Cleanup Objectives (TAGM #4046, January 1994). Adjusted to site total organic carbon (TOC) content for semi-volatiles. Total PCB cleanup objective

[2] 95% UPL not available; value represents 95% percentile

[3] Use of value not recommended; most of the results for Aroclor 1254 were non-detects. Computation of background PRGs based upon such data sets cannot be considered reliable.

[4] Analytical methods are: OLM04.2 for organics; ILM05.2-ICP-AES for inorganics; DLM01.4 for dioxins/furans

a Total SVOCs <500,000 µg/kg, individual SVOCs <50,000 µg/kg

b Values are calculated based on site average organic carbon content of 3.52%

c NYSDEC RSCO is based upon total PCBs adjusted for a soil organic carbon content of 5%; these values are also consistent with EPA's "A Guide on Remedial Actions at Superfund Sites With PCB contamination, August 1990"

d OSWER Directive 9355.4-12, "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities (August, 1994).

Table 14
Sub-surface Soil PRGs
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Chemical Name	NYSDEC RSCO [1]	Site-Specific Impact to Groundwater	Human Health Risk-Based PRGs (1×10^{-6}, HQ=1)[+]	Site-Specific Background Value Subsurface Soil			CRQL for analytical method [4]	Detection Range	Detection Frequency	PRG Exceedence	PRG	
				Maximum	95% UPL with outliers	95% UPL without outliers					Value	Source
Volatile Organic Compounds mg/kg												
Total VOCs	NA	10	NA	NA	NA	NA	NA	NA	NA	NA	10	NYSDEC
Semi-volatile Organic Compound [a,b] µg/kg												
Benzo(a)anthracene	788	-	53,411	9,800	7,372 [2]	3,235	330	93 - 24,000	57/58	0/58	53,411	HHRA
Benzo(a)pyrene*	214	-	5,341	4,700	4,131	2,722	330	120 - 22,000	57/58	5/58	5,341	HHRA
Benzo(b)fluoranthene	3,868	-	53,411	7,900	6,539 [2]	3,695 [2]	330	110 - 19,000	56/58	0/58	53,411	HHRA
Dibenzo(a,h)anthracene	49	-	5,341	2,200	1,608 [2]	841 [2]	330	46 - 4,300	36/58	0/58	5,341	HHRA
Indeno(1,2,3-cd)pyrene	11,251	-	53,411	3,900	3,605 [2]	2,111	330	79 - 15,000	52/58	0/58	53,411	HHRA
Pesticide/Polychlorinated biphenyl (µg/kg)												
Aroclor-1254	10,000 [c]	-	10,905	190	190 [3]	19 [3]	33	52 - 27,000	53/57	2/57	10,000	NYSDEC
Inorganic Compound (mg/kg)												
Arsenic*	7.5 or SB	6.2	33	6.8	6.8	NO	3	5.1 - 73.1	48/48	4/48	33	HHRA
Cadmium	1 or SB	430	365	1.4	1.4	NO	1	0.23 - 143	57/58	0/58	365	HHRA
Copper	25 or SB	910	30,970	314.0	314.0	48.0	5	53 - 6,650	48/48	0/48	30,970	HHRA
Iron	2,000 or SB	150	NL	25,800.0	26,744.0	NO	20	23,400 - 153,000	58/58	56/58	25,800	SB
Lead**	SB	270	400 [d]	457.0	335.0 [2]	NO	2	134 - 9,970	48/48	38/48	400	HHRA
Mercury	0.1	8	77	0.7	0.6	0.43	0.1	0.14 - 9.1	57/58	0/58	77	HHRA
Vanadium	150 or SB	NL	5,420	24.3	23.6	NO	10	17.6 - 380	58/58	0/58	5,420	HHRA
Zinc	20 or SB	53,000	232,273	158.0	229.0	NO	12	107 - 33,300	58/58	0/58	232,273	HHRA

Notes:

[+] based on construction worker scenario

* risk driver in the medium

** no toxicity values for risk calculation, but most prevalent and a COPC in all media, except surface water

HHRA = human health risk-based

PRG = preliminary remedial goal

UPL = upper prediction limit

CRQL - contract required quantitation limit

NYSDEC RSCO = New York State Department of Environmental Conservation Recommended Soil Cleanup Objectives

SB = site background

NA = not applicable

NO = no outliers identified

NL = no toxicity value

µg/kg = micrograms per kilogram

[1] NYSDEC Soil Cleanup Objectives (TAGM #4046, January 1994). Adjusted to site total organic carbon (TOC) content.

[2] 95% UPL not available; value represents 95% percentile

[3] Use of value not recommended; most of the results for Aroclor 1254 were non-detects. Computation of background PRGs based upon such data sets cannot be considered reliable.

[4] Analytical methods are: OLM04.2 for organics; ILM05.2-ICP-AES for inorganics; DLM01.4 for dioxins/furans

a Total SVOCs <500,000 µg/kg, individual SVOCs <50,000 µg/kg

b Values are calculated based on site average organic carbon content of 3.52%

c NYSDEC RSCO is based upon total PCBs adjusted for a soil organic carbon content of 5%; these values are also consistent with EPA's "A Guide on Remedial Actions at Superfund Sites With PCB contamination, August 1990".

d OSWER Directive 9355.4-12, "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities (August, 1994).

Table 15
Volumes to Be Remediated
Consolidated Iron and Metal Superfund Site
Newburgh, New York

Treatment/Excavation Interval	To Groundwater		Six Feet bgs	
	PRG (mg/kg)	Volume (YD^3)	PRG (mg/kg)	Volume (YD^3)
Surface Soil Lead	***400***		***400***	
0 to 2-foot excavation interval [1]		28,072		28,072
Sub-surface Soil Lead	***400***		***400***	
2 to 4-foot excavation interval [1]		24,173		24,173
4 to 6-foot excavation interval [2]		n/a		25,809
4 to 10-foot excavation interval [2]		54,642		n/a
Total Excavation Volume		***106,886***		***78,053***

Notes:

1. Volumes for these intervals were calculated using CLP data.
2. Volumes from this interval were calculated using XRF screening data.

n/a= not applicable
bgs= below ground surface

Table 16
Alternative 4 Cost Summary
Partial Excavation of Site Soils with Off-site Disposal, Backfill with Clean Soil, and Site Management Plan
Consolidated Iron and Metal Superfund Site, Newburgh, New York

Item No.	Item Description	Quantity	Unit Cost	Unit	Extension
CAPITAL COSTS					
1. General Requirements					
1a.	Mobilization	1	$ 201,000.00	LS	$ 201,000
1b.	Workplans	1	$ 45,000.00	LS	$ 45,000
1c.	Temporary Facilities	2.5	$ 61,579.74	6 MONTHS	$ 153,949
1d.	Surveying	1	$ 6,350.00	LS	$ 6,350
1e.	Health and Safety	2.5	$ 93,677.50	6 MONTHS	$ 234,194
1f.	Construction Management	2.5	$ 89,001.38	6 MONTHS	$ 222,503
	Total General Requirements				**$ 862,997**
2. Construction Costs					
2a.	Erosion Control	1000	$ 2.18	LF	$ 2,180
2b.	Staging Area	1	$ 38,400.00	LS	$ 38,400
2c.	Excavate/Demolition	1	$ 408,455.78	LS	$ 408,456
2d.	Backfill	1	$ 877,934.91	LS	$ 877,935
2e.	Dust Control & Misc Support	1	$ 14,388.00	LS	$ 14,388
2f.	Post Excavation Sampling	1	$ 261,080.00	LS	$ 261,080
2g.	Monitoring Wells Installation	1	$ 21,391.50	LS	$ 21,392
	Total Construction Costs				**$ 1,623,830**
3. Transportation & Disposal (T&D)					
3a.	Hazardous, Subtitle C	50,542	$ 168.31	Ton	$ 8,506,832
3b.	Non Hazardous, Subtitle D	50,542	$ 68.00	Ton	$ 3,436,823
3c.	Non Hazardous, Concrete and Debris	1	$ 230,145.91	LS	$ 230,146
	Total T&D Costs				**$ 12,173,801**
4. Treatment (NOT APPLICABLE)					$ -
	SUBTOTAL CAPITAL COSTS				**$ 14,660,628**
5.	General Contractor Overhead and Profit (30% contruction and 10% T&D)				$ 1,704,529
6.	Design Engineering	1	$ 400,000	LS	$ 400,000
7.	Resident Engineering/Inspection	1	$ 300,000	LS	$ 300,000
8.	Contingency (15% capital)				$ 2,199,094
9.	Pre-Design Investigation	1	$ 500,000	LS	$ 500,000
10.	Treatability Study				$ -
	TOTAL CAPITAL COSTS				$ 19,764,252
ANNUAL O&M COSTS					
11.	**Total Annual O&M Costs (NOT APPLICABLE)**				$ -
ANNUAL MONITORING COSTS					
12.	Project Planning and Organizing	1	$ 2,400	LS	$ 2,400
13.	Field Sampling Labor	1	$ 3,960	LS	$ 3,960
14.	Sampling Equipment, Shipping, Consumable Supplies	1	$ 2,600	LS	$ 2,600
15.	Sample Analysis and Data Validation	1	$ 6,900	EA	$ 6,900
16.	Data Evaluation and Reporting	1	$ 10,500	LS	$ 10,500
	SUBTOTAL MONITORING COSTS				**$ 26,360**
17.	Contingency (15% monitoring)				$ 3,954
	TOTAL MONITORING COSTS				$ 30,314
PRESENT WORTH OF COSTS					
18.	Total Capital Costs				$ 19,764,252
19.	Annual O&M Costs (30 year duration)				$ -
20.	Annual Monitoring Costs (30 years duration)				$ 376,166
21.	TOTAL PRESENT WORTH				**$ 20,140,418**

Assume: $ 20,150,000

APPENDIX III

ADMINISTRATIVE RECORD INDEX

CONSOLIDATED IRON AND METAL
SUPERFUND SITE
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2.0 REMOVAL RESPONSE

2.5 Action Memorandum

P. 200001 - 200011 Memorandum to Mr. Richard L. Caspe, Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, from Mr. Michael Ferriola, On-Scene Coordinator, Response and Prevention Branch, U.S. EPA, Region 2, re: Request for a Removal Action at the Consolidated Iron & Metal Co., Inc. Site, Newburgh, Orange County, New York - ACTION MEMORANDUM, May 21, 1999.

P. 200012 - 200026 Memorandum to Ms. Jeanne M. Fox, Regional Administrator, U.S. EPA, Region 2, from Mr. Michael Ferriola, On-Scene Coordinator, Response and Prevention Branch, U.S. EPA, Region 2, re: Request for a Ceiling Increase and Waiver of $2 Million Limitation for the Removal Action at the Consolidated Iron & Metal Co., Inc. Site, Newburgh, Orange County, New York - ACTION MEMORANDUM, September 9, 1999.

P. 200027 - 200031 Memorandum to Ms. Jane M. Kenny, Regional Administrator, U.S. EPA, Region 2, from Mr. George Pavlou, Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, re: ACTION MEMORANDUM: Authorization to Provide Funding for Emergency Rapid Response Services Contractor for Site Clearing Activities at the Consolidated Iron and Metal Site, Newburgh, New York, June 5, 2003.

2.7 Correspondence

P. 200032 - 200033 Memorandum to Mr. Bruce Sprague, Chief, Response and Prevention Branch, U.S. EPA, Region 2, from Mr. John E. LaPadula, Chief, New York Remediation Branch, U.S. EPA, Region 2, re: Consolidated Iron and Metal Superfund Site, Orange County, NY, Emergency Removal Action Request, July 19, 2002.

3.0 REMEDIAL INVESTIGATION

3.3 Work Plans

P. 300001 - 300212 Report: Final Work Plan Volume I, Consolidated Iron and Metal, Remedial Investigation/Feasibility Study, Newburgh, Orange County, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, February 4, 2003.

3.4 Remedial Investigation Reports

P. 300213 - 300248 Report: Stage IA Cultural Resources Survey, Remedial Investigation Feasibility Study, Consolidated Iron and Metal Superfund Site, City of Newburgh, Orange County, New York, prepared by Richard Grubb & Associates, Inc., prepared for CDM Federal Programs Corporation, September 13, 2004.

P. 300249 - 300458 Report: Final Screening-Level Ecological Risk Assessment, Consolidated Iron and Metals Superfund Site, Remedial Investigation/Feasibility Study, Newburgh, New York, prepared by CDM Federal Programs Corporation, prepared for.U.S. Environmental Protection Agency, March 31, 2006.

P. 300459 - 301030 Report: Final Human Health Risk Assessment Report, Consolidated Iron and Metals Superfund Site, Newburgh, New York, Remedial Investigation/ Feasibility Study, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, May 12, 2006.

P. 301031 - 301323 Report: Final Remedial Investigation Report, Volume I, Consolidated Iron and Metal Site, Remedial Investigation/Feasibility Study, Newburgh, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, July 5, 2006.

P. 301324 - 302580 Report: Final Remedial Investigation Report, Volume II, Consolidated Iron and Metal Site, Remedial Investigation/Feasibility Study, Newburgh, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, July 5, 2006.

P. 302581 - Letter (with enclosure) to Mr. Michael Negrelli,
302592 Remedial Project Manager, U.S. EPA, Region II, from Ms. Jeanne Litwin, REM, RAC II Technical Operations Manager, CDM Federal Programs Corporation, re: Addendum to Final Screening Level Ecological Risk Assessment Report, Consolidated Iron and Metal Superfund Site, Remedial Investigation/Feasibility Study, Newburgh, New York, July 7, 2006.

3.5 Correspondence

P. 302593 - Letter (with Attachments) to Mr. Michael J.
302619 Negrelli, Remedial Project Manager, U.S. Environmental Protection Agency, Region 2, from Ms. Jean-Ann McGrane, City Manager, City of Newburgh, Office of the City Manager, re: City of Newburgh - Consolidated Iron and Metal Superfund Site, December 23, 2005.

P. 302620 - Letter (with Attachments) to Carol Berns, Esq.
302624 U.S. Environmental Protection Agency, Region 2, from Mr. Geoffrey E. Chanin, Corporation Counsel, The City of Newburgh, Office of the Corporation Counsel, re: Consolidated Iron & Metal Site, Washington Street - Section 40, Block 3, Lot 3, City of Newburgh, New York, June 12, 2006.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - Report: Final Feasibility Study Report,
400273 Consolidated Iron and Metal Site, Remedial Investigation/Feasibility Study, Newburgh, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. Environmental Protection Agency, July 17, 2006.

6.0 STATE COORDINATION

6.3 Correspondence

P. 600001 - Letter to Ms. Kristen Kulow, New York State
600002 Department of Health (NYSDOH), from Mr. Michael Negrelli, Remedial Project Manager, New York Remediation Branch, U.S. EPA, Region 2, re:

Consolidated Iron and Metal Superfund Site, Newburgh, New York, July 6, 2006.

P. 600003 - 600003 Letter to Mr. John LaPadula, NY Remediation Branch Chief, U.S. EPA, Region 2, from Mr. Dale A. Desnoyers, Director, New York State Department of Environmental Conservation, re: Superfund Proposed Plan, Consolidated Iron and Metal, Site # 3-36-055, City of Newburgh, Orange County, July 21, 2006.

7.0 ENFORCEMENT

7.4 Consent Decrees

P. 700001 - 700017 Settlement Agreement, United States Bankruptcy Court for the District of Delaware, In re: Metal Management, Inc., et al, Debtors. Chapter 11, Case No. 00-4303 (EIK) (Jointly Administered), July 3, 2002.

P. 700018 - 700031 Settlement Agreement, In The United States Bankruptcy Court For the Southern District of Texas, Houston Division, In Re: Philip Services Corporation, et al., Debtor. Jointly Administered Under Case No. 03-37718-H2-11, May 20, 2004.

7.5 Affidavits

P. 700032 - 700150 Deposition, United States Environmental Protection Agency, Region II, In the Matter of Michael Laskin, Proceeding Relating to the Consolidated Iron and Metal Co. Inc. Superfund Site Under Section 122(e)(3)(B) of the Comprehensive Environmental Response, Compensation, and Liability Act 42 U.S.C. 9622(e)(3)(B), Index No. CERCLA-02-SUB-2001-2016, April 12, 2001.

7.8 Correspondence

P. 700151 - 700157 Letter to Attached List of Addressees from Mr. George Pavlou, Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, re: Special Notice Concerning Remedial Investigation/ Feasibility Study at the Consolidated Iron & Metal Co., Inc. Superfund Site, Newburgh, New York, February 10, 2003.

8.0 HEALTH ASSESSMENTS

8.1 ATSDR Health Assessments

P. 800001 - 800047 Report: <u>Public Health Assessment for Consolidated Iron and Metal, Newburgh, Orange County, New York, EPA Facility ID: NY0002455756</u>, prepared by New York State Department of Health Center for Environmental Health Under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry, May 25, 2004.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P. 10.00001- 10.00013 Superfund Proposed Plan, Consolidated Iron and Metal Superfund Site, New Burgh, New York, prepared by U.S. EPA, Region 2, July 2006.

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10.0 PUBLIC PARTICIPATION

10.1 Comments and Responses

P. 10.00014- 10.00014 Letter to Carol Berns, Esq., Assistant Regional Counsel, Office of Regional Counsel, U.S. EPA, Region 2, from Hiroko Muraki Gottlieb, Senior Attorney, Corporate Environmental Affairs, IBM, re: Consolidated Iron and Metal Site, Newburgh, New York, August 8, 2006.

P. 10.00015- 10.00016 Letter to Mr. Michael Negrelli, US EPA Remedial Program Manager, U.S. EPA, Region 2, from Ms. Jean-Ann McGrane, City Manager, City of Newburgh, re: Consolidated Iron and Metal site, EPA ID#NY0002455756, August 9, 2006.

P. 10.00017- 10.00017 Letter to Mr. Michael Negrelli, Remedial Project Manager, New York Remediation Branch, U.S. EPA, Region 2, from Mr. James D. McIver, Jr., Associate and Project Director, Fuss & O'Neill of New York, PC, re: Request for an Extension of the Public Comment Period, Consolidated Iron and Metal Superfund Site, Newburgh, New York, August 10, 2006.

P. 10.00018- 10.00019 Letter to Ms. Jean-Ann McGrane, City Manager, City of Newburgh, from Mr. Michael J. Negrelli, Remedial Project Manager, New York Remediation Branch, U.S. EPA, Region 2, re: Consolidated Iron and Metal Site, Proposed Plan for Site Remediation, August 21, 2006.

10.3 Public Notices

P. 10.00020- 10.00020 United States Environmental Protection Agency Announces an Extension of the Public Comment Period on the Proposed Plan for the Consolidated Iron and Metal Site, City of Newburgh, Orange County, New York, undated.

10.4 Public Meeting Transcripts

P. 10.00021- 10.00112 Minutes of the Consolidated Iron and Metal Superfund Site Public Information Session, dated August 7, 2006, Newburgh, New York, 7:12 p.m. - 9:20 p.m., Donna M. Wells, Reporter, Mary T. Babiarz Court Reporting Service, Inc.

APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, 12th Floor
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **FAX:** (518) 402-9020
Website: www.dec.state.ny.us

Denise M. Sheehan
Commissioner

SEP 29 2006

Mr. George Pavlou
Director
Emergency & Remedial Response Division
USEPA Region II
290 Broadway
New York, New York 10007-1866

Re: Record of Decision
Consolidated Iron & Metal
Site No. 3-36-055
City of Newburgh, Orange County

Dear Mr. Pavlou:

The New York State Department of Conservation (Department) and the New York State Department of Health (NYSDOH) have reviewed the September 2006 Record of Decision (ROD) for the Consolidated Iron & Metal site, Orange County. Based on that review, I understand that the selected remedy includes excavation and off-site disposal of soils exceeding the EPA's residential cleanup criteria for lead to a depth of six feet below ground surface. Soils deeper than six feet below the ground surface with volatile organic compounds or polychlorinated biphenyl contamination exceeding Department cleanup guidelines will also be excavated to the groundwater table and disposed of off-site.

Also, institutional controls will be imposed in the form of an environmental easement and/or restrictive covenant and compliance with an EPA approved site management plan. The site management plan will provide for the proper post-construction management of all site remedy components and institutional controls that shall include: (a) monitoring of site groundwater to ensure that, following the soil excavation, the contamination is attenuating and groundwater quality continues to improve; (b) an inventory of any use restrictions on the site consistent with a restricted residential use scenario; (c) necessary provisions for ensuring the easement/covenant remains in place and is effective; (d) provision for any operation and maintenance required of the components of the remedy, and (e) the requirement that the owner or person implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

Based on this information, I concur with the remedy and believe it is protective of human health and the environment. If you have any questions, please contact Mr. Michael Ryan at (518) 402-9564.

Sincerely,

Dale A. Desnoyers
Director
Division of Environmental Remediation

cc: M. Ryan
M. Rivara, NYSDOH

APPENDIX V

RESPONSIVENESS SUMMARY

RECORD OF DECISION - CONSOLIDATED IRON AND METAL SITE

RESPONSIVENESS SUMMARY

A summary of comments and EPA's responses regarding the remedial investigation/feasibilty study (RI/FS), Proposed Plan, and Superfund process with respect to the Consolidated Iron and Metal Superfund site are provided below. Comments received and responses provided during the public meeting held on August 7, 2006 appear in Section I. Written comments received by EPA during the public comments period, and EPA's responses, appear in Section II.

I. Comments from the Public Meeting on August 7, 2006

Comment 1: Comparing the costs of Alternatives 3 and 4, it seems that the annual monitoring costs of Alternative 3 can be eliminated since all the contaminated soils to the water table will be removed; in this case, the cost of the two alternatives is about the same. Why not choose Alternative 3 and remove all contaminated material to the water table?

Response: The difference in cost between the two alternatives without the monitoring component is $6.6 million. EPA believes that this additional cost of remediating all soils to the top of the water table is not warranted since data collected across the site indicate the inorganic contamination strongly binds to the soil and is not moving into other media such as the groundwater or surface water. Alternative 4 calls for removal of soils below six feet that exceed the NYSDEC Recommended Soil Cleanup Objectives for total volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs). These soils will be excavated because VOCs, and PCBs, when in combination with VOCs, are generally more mobile and therefore more likely to migrate into groundwater or surface water. In addition, the risk at the site is primarily from contact with the soils. Alternative 4 mitigates that risk under reasonably anticipated future land use scenarios and the difference in cost between the two alternatives is significant. In choosing Alternative 4, some contamination will be left behind, but any risks associated with that contamination will be addressed by the institutional controls site management plan (SMP). Also, although Alternative 3 features the removal of contaminated soils to the groundwater table, annual monitoring would still be needed to ensure that the remedy remains protective and to confirm that the source removal actions have a positive impact on groundwater quality.

Comment 2: Two very large barges were sunk in the northeast corner of the site 20 to 30 years ago. Now they are filled up with all that contaminated material and acting like a great big tea bag every six hours when the tide changes. I would like to make it part of the record to identify those barges.

Response: EPA is aware of reports that barges were sunk to create new land along the bank of the Hudson River at or near the site property. During the pre-design investigation to be conducted as part of the remedy, EPA will note any evidence of the barges. As for the material within the barges acting as a continuing source of contamination during tidal fluctuations, the site data do not support this notion. Results from the RI indicate that contamination at the site has not significantly impacted the surface water of the Hudson River adjacent to the site. Results from the RI also indicate that contamination at the site has not significantly impacted the sediment adjacent to the site above background levels.

Comment 3: Is the monitoring well system in place at the site?

Response: Yes, as part of the remedial investigation, a total of nine monitoring wells were installed and two rounds of groundwater samples were collected from the monitoring wells.

Comment 4: EPA stated that MW-5 shows high levels of contamination but did not give the results for the other wells and the parameters that were tested.

Response: In its presentation at the public meeting, EPA concentrated on the most significant findings of the RI; the detailed analysis of each round of samples in each monitoring well can be found in the RI Report. EPA tested the groundwater samples for more than 300 different chemicals. Chemicals that exceeded the groundwater maximum contaminant levels (MCLs) include gasoline-related volatile organic compounds (e.g., benzene, methyl tert-butyl ether [MTBE], xylene, and ethylbenzene), iron, lead and zinc. Each of these contaminants exceeded MCLs in well MW-5. For the other eight monitoring wells, the MCLs for iron and zinc were most frequently exceeded. The concentrations of these compounds often exceeded the national secondary drinking water regulations, or secondary maximum contaminant levels (SMCLs). SMCLs are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects in drinking water. The presence of iron and zinc in drinking water can cause it to have a metallic taste. Iron can also cause discoloration of laundry and staining. The SMCLs for these compounds are based on these effects rather than an actual health effect.

Comment 5: What types of buildings would be able to be constructed if you excavate to 6 feet or to 12 feet? Are there any future uses of the site that would be precluded with the preferred remedy?

Response: The reasonably anticipated future land use was considered when the alternatives were evaluated. EPA has discussed with the City of Newburgh its master plan for the waterfront and it is quite broad. The City intends to develop this site and that development includes residential housing, as well as commercial and recreational uses. EPA believes that removing six feet of contaminated soil using the residential cleanup number for lead will not interfere with the future construction of residential housing on this site. Additionally, potential redevelopment of the site that would require any disturbance of the soils in the 6 feet to 12 feet range would not be precluded but would have to be done in accordance with the institutional controls and SMP to ensure the proper handling, treatment, and disposal of those soils.

Comment 6: Can you please re-explain the differences between Alternative 3 and Alternative 4 and the pros and cons of each?

Response: Both alternatives involve soil removal, institutional controls, and groundwater monitoring. Alternative 3 removes contaminated soil from the surface to the water table, which is about 12 feet below the ground surface. Alternative 4 removes contaminated soil from the surface to six feet below the ground surface. In addition, soil below six feet to the water table that is found to contain total VOCs or total PCBs above 10 parts per million will be removed. These cleanup numbers for VOCs and PCBs are for the protection of groundwater and the area of excavation is expected to be in localized areas of the site. Both alternatives include disposal of the excavated soil at a permitted, off-site disposal facility. Both alternatives eliminate risks consistent with the reasonably anticipated future land use of the site. Alternative 4 includes a SMP and institutional controls to address future development plans that may require access to the soils below six feet that will be left behind and may have contamination. Based on reasonably anticipated future land use and common construction practices, EPA believes that during development of the site, there will be no need to remove soil below six feet. However, it is possible that deeper activities can be done as long as those soils are addressed properly in accordance with the institutional controls and SMP.

Alternative 3 would remove more soil than Alternative 4, but also

costs significantly more. For these reasons, EPA prefers Alternative 4; it is protective of human health and the environment and also costs less.

Comment 7: The Consolidated Iron facility was licensed by New York State as a dismantler and salvage scrap yard. In my opinion the license means the person who has the license and who issues it should be responsible for the results of their actions, not the people who sold cars to them. Where were the people who licensed them? Where's their responsibility in this to pay? How does EPA or the Federal government feel that people who sent material to the licensed scrap yard are responsible to pay for the cleanup? When we brought cars to Consolidated Iron 10, 15, 20 years ago, there was no law against what we did.

Response: EPA recognizes that at one time the site may have been a licensed facility, but the Superfund law is a strict liability statute meaning it imposes liability on certain classes of parties without regard to fault. Consequently, even if you relied on the site being a licensed facility, if you sent cars or other materials that contained hazardous substances to the site and there was a release causing the government to spend money, you are considered a potentially responsible party at the site. The Superfund law also applies retroactively so that even if what you did was legal twenty years ago, you can still have liability for it. The statute is written so that it only addresses the liability of people who owned or operated the site or generated or transported the hazardous substances that were brought to the site. Agencies that permitted the facility do not fall within these liability provisions. However, the government can take into consideration a potentially responsible party's ability to pay, so if you receive a letter from EPA telling you that you have potential liability at the site, EPA can consider an inability to pay the full amount.

Comment 8: This area is an environmental justice area.

Response: The comment is noted and its applicability to actions at the site will be evaluated.

Comment 9: There was no mention tonight about the cumulative impact associated with health assessments with other sites in the area. It is my understanding that there are quite a few other sites that are contaminated, some of them right next door to this site, and the cumulative impact to the groundwater, to the air and to the people who live in the area needs to be reviewed.

Response: The Superfund program is designed to address hazardous substances in environmental media on a site-by-site basis. If there was evidence that contamination at this site migrated from an off-site source area, we would address it as part of this action. The data collected at this site do not indicate other sources of contamination beyond what was brought to and processed on the site property.

Comment 10: The Consolidated Iron site is in a flood zone and tides may impact the site.

Response: EPA recognizes that the Consolidated Iron site is in a flood zone. All applicable or relevant and appropriate laws, both federal and State, that apply to floodplains will be complied with during the remedial action. In addition, the potential impact of tides will be further evaluated during the pre-design investigation. EPA does not currently believe this is a significant contaminant pathway.

Comment 11: I recall that pesticides - DDD and DDE - were detected. What happened to them?

Response: EPA tested the site media for a standard list of pesticides, but they were not determined to be among the group of contaminants of concern. However, since the preferred remedy calls for removal of the top six feet of soil, any pesticides in those soils will also be removed.

Comment 12: Adjacent to the site is a public boat ramp. I'm concerned about exposures to boaters, especially children, who may get into the water on a hot summer day. The boat ramp is heavily used and jet skis are operated right next to the site. Are they being exposed to contamination?

Response: EPA's testing of the sediments adjacent to the site showed that the cancer risks were within or below EPA's acceptable target range and below the noncancer threshold for all receptors. Surface water was not quantitatively evaluated in the risk assessment because the concentrations of contaminants detected in this medium were very low and did not exceed conservative health-based screening values. The samples were taken approximately 125 feet offshore, as close to shore as possible with the type of boat used to collect the samples. As part of the pre-design investigation, additional samples beyond the site property boundary will be taken to assess further whether contamination has migrated off-site and needs to be included with the remedial action. A

surface water and sediment sample at the public boat launch will be included as part of this investigation to verify that the surface water and sediment is safe in this localized area.

Comment 13: Please explain the potentially responsible party (PRP) identification process because some of our local businesses are concerned about their liability on this property. Have the PRPs been notified already? If not, when would they be notified? How do you do an assessment of their liability? What happens in the case that EPA cannot recover all the costs? If the City's capacity and the small business capacity to pay does not meet the cost, how would you fill in that undetermined amount that you cannot recover?

Response: EPA conducted a PRP search which involved taking all the site records we could find and organizing them into categories. We came up with five categories of materials responsible for the site contamination which would make someone a PRP: cars, tires, white goods (kitchen appliances), transformers, and electronic equipment. After we went through the records and segregated them, we determined which companies or individuals were viable parties that we could locate. When we locate the parties, we input their waste information into a database which we are still in the process of finalizing.

In August 2002, we sent out letters to locatable parties in the database notifying them of their status as PRPs. In 2003, before we started the RI/FS, we sent out letters to all the parties we had identified at that time and invited those parties to undertake the RI/FS. At that point, no one stepped forward.

EPA is now in the process of finalizing our PRP list. For those parties who sent minimal amounts of waste to the site, known as de minimis parties, we will shortly be offering individual settlements based on their share of the material sent to the site. After the Record of Decision is issued, EPA will be looking to the the major PRPs to undertake the remedy. If they do not perform the cleanup, EPA will fund it. If EPA funds the remedy, we will seek reimbursement from the major parties and other nonsettlors for the money EPA has spent.

Comment 14: If a particular PRP is given an assessment and EPA provides them an amount that EPA thinks is fair, is there an appeal process so if a city or small business is cash strapped they could appeal based on mitigating circumstances?

Response: If a PRP has been determined by EPA to be de minimis, and

the party can present EPA with information that might lower their waste percentage, EPA would evaluate that information which might lower the assessment. EPA would also take into account the party's ability to pay. However, in order to substantiate inability to pay, the party would have to provide EPA with financial records.

Comment 15: Consolidated Iron and Metal went out of business for bankruptcy. How can EPA trust the records you went through in order to determine the private citizens who should kick in money? Are the Consolidated Iron records that trustworthy?

Response: The company did not go through bankruptcy although its principal officer, Michael Laskin, did. When it ceased operations, the company left all of its business records at the site. EPA took the paper files the company had maintained and interviewed the owner for additional information. EPA reviewed the written transaction records that had names on them and, in certain cases, we sent out information request letters to parties and asked them about their involvement. EPA also called a number of parties to verify that they sent waste to the site.

Comment 16: If PRPs do end up having to pay money for the remedy, is it deductible?

Response: Our current understanding of tax law is that cleanup costs are tax deductible but that penalties (*e.g.*, for failure to comply with an order) are not. It is recommended that the questioner contact their tax accountant or the IRS for further information.

Comment 17: Did the owner of the site go bankrupt and will he be held responsible for the cleanup?

Response: The former site owner was Consolidated Iron and Metal Co., Inc. It dissolved in 2001 and its primary asset was the site, which the City took in a tax foreclosure in 2004. The principal officer of the company went through bankruptcy and was discharged. As a result, EPA is precluded from making a claim against him. However, we are still evaluating whether Consolidated Iron and Metal Co., Inc. had any insurance that might cover any of the cost.

Comment 18: Why did EPA propose two cleanups going down 12 feet if the six-foot cleanup is going to allow you to put all the same things in? EPA is saying six feet in one instance and 12 feet in the other. That makes no sense. Another thing is that there has been some clean up done on that site (therefore the no action alternative makes no sense).

Response: As required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), EPA evaluated various alternatives, but we are proposing that we implement Alternative 4, which removes all soil down to six feet. The confusion stems from the fact that this alternative also provides for additional excavation to the water table (approximately 12 feet) for VOCs and PCBs, with the location and amount of this additional material to be determined by pre-design sampling. However, the area of the site potentially impacted by VOCs and PCBs is expected to be relatively small, concentrated in localized areas. This differs from Alternative 3, which proposes to remove all impacted soil from the site down to the water table; this would be a much larger volume of material than Alternative 4. EPA's established rules for evaluating alternatives requires us to look at different remedial options for a site. This also includes a "no action" alternative. The no action alternative is always included as a baseline for comparison with the other alternatives. The no action alternative essentially means no *further* action. The actions performed previously were to address immediate threats to human health and the environment. The FS was performed after EPA's removal work at the site, including the surface clearing, were completed; therefore the no action alternative evaluates site conditions as they exist today.

Comment 19: Why were your second round of groundwater samples all with higher numbers, which means this stuff is settling in and getting into the well water?

Response: It is not unusual for there to be some variation in results between two rounds of groundwater sampling. For some chemicals, the second round results were higher. Conversely, second round results for other chemicals were lower than the first round. This is typical and can sometimes be attributed to conditions at the time the well was sampled (*e.g.*, seasonal flow, weather conditions such as drought, recent rain events, etc.) However, variations in the results of the two rounds of sampling were relatively minor. Any major variations would have been noted and subject to further sampling to assess the cause of any anomaly.

Comment 20: When EPA was developing the alternatives, did you think about on-site treatment as one of the alternatives? Can metal stabilization and thermal desorption be done for less money? You could stabilize some of that soil and put it in the part of the site in the development plan that's paved.

Response: In the preliminary screening of alternatives in the FS, EPA considered a treatment alternative using stabilization. The problem with applying on-site treatment at the site is the heterogenous nature of the contamination. On-site treatment is better suited to a site with more homogenous contamination. Lead is a primary contaminant at the site and for metals thermal desorption would not be applicable. Because there are lesser amounts of VOCs or polycyclic aromatic hydrocarbons (PAHs), we focused on stabilization as the most viable treatment technology. However, although the treatment alternative was discussed in the FS, it was not carried through to the analysis of alternatives stage because it was not compatible with the anticipated future site use in that it would limit what could be built on the site.

Comment 21: When the Record of Decision is done, will EPA allow a developer to come in and say I can meet your criteria? Can I go to the town and say here's a way to fit the nine criteria?

Response: The nine criteria are used for remedy selection under the Superfund program and are not part of what the future use of the site may be. Once EPA selects the remedy in the ROD, EPA will ask the PRPs to carry out the remedy. If the PRPs implement the remedy, either through a consent decree or unilateral administrative order, they must do so in accordance with the ROD. The PRPs may use any qualified party to perform the work, which may include developers. EPA would provide oversight to ensure that the remedy is carried out in accordance with the ROD. Should the PRPs decline to perform the work, EPA will proceed using one of the pre-established contract vehicles available to us. Future development at the site will need to comply with the ROD remedy in that institutional controls and the SMP will limit groundwater use and dictate the handling of soils below six feet, respectively.

Comment 22: If EPA starts with Alternative 4 and some condition is found that is worse than expected and EPA wants to go deeper, can it be converted to Alternative 3 or something else, should a condition like that exist?

Response: The remedy calls for gathering more information in the design phase of the project. If we find that conditions are different than we believe they are today, EPA can amend the cleanup plan and do something different. If the changed conditions suggest the need for a fundamental change in the cleanup approach, EPA would go through the decision-making process again and seek public comment on the changed plan.

Comment 23: I didn't see how the excavated material will actually travel from where it is today to wherever it is going to be disposed. EPA should keep trucks off Washington Street and anywhere except major arteries, Broadway not being one of them. We have the CSX rail line, so is there any possibility the soil can go on rail cars?

Response: The routing of trucks, or other transportation plan, will be included in the design. The use of the CSX track to try to minimize heavy truck traffic will be evaluated.

Comment 24: Did EPA look at the need for piles to support building foundations? Piles may need to go deeper than six feet.

Response: EPA did not look at the need for piling at the site.

Comment 25: Was a Phase I environmental assessment completed for the site?

Response: No. Phase I assessments are typically performed under the State or federal Brownfields program. Superfund law requires that we perform a remedial investigation, which is a more comprehensive study. The RI for the site was completed in July 2006.

Comment 26: Was any neighboring contamination addressed, such as sunken barges or old piles?

Response: EPA collected background samples throughout the waterfront in the vicinity of the site for all the site media. However, these data are used for comparison purposes, not to investigate or address off-site contamination. However, as part of the pre-design investigation, sampling will be performed beyond the immediate property boundary to determine if there is a need to extend the limits of the soil excavation.

Comment 27: EPA stated MW-5 had higher VOCs. Was the VOC concentration in the other monitoring wells above your levels?

Response: VOC contamination in the other wells was generally below MCLs, which are drinking water criteria defined by State and federal law. In a few instances MTBE (in MW-3, 4, 7, and 8), and in one instance benzene (in MW-9), exceeded the MCL slightly.

Comment 28: Was there any investigation as to the source of the VOCs in MW-5?

Response: MW-5 is downgradient from the process area of the site. In one of the process buildings and in some of the soil borings in the vicinity, EPA saw evidence of petroleum-like liquids. EPA thinks the VOCs came from activities in the process area of the site which migrated toward MW-5. Part of the remedy's pre-design investigation includes further evaluation of potential on-site VOC source areas.

Comment 29: Did EPA look at sheet pilings on the waterfront to try to isolate any migration of contamination into the river?

Response: Because the groundwater contamination was essentially limited to one well, the removal of the VOC- and PCB-contaminated soils to the water table should result in an improvement in the groundwater quality and eliminate the need for groundwater controls, such as sheet piling. Monitoring the groundwater to determine that this is occurring is a component of the remedy. Furthermore, the use of sheet piling would require that hydraulic controls be employed, which would increase remediation costs significantly.

Comment 30: Describe the five-year review. Is a five-year review at the end of five years or is it continual for the next 25 years, or is there a magic number that is in place?

Response: Reviews of the site will be conducted every five years until the site can be used with absolutely no restrictions. The first five-year review would be performed five years after the start of construction activities.

Comment 31: When you dig up the dirt that needs to be dug up, do little particles and contamination become airborne as you dig? What is done to protect those in downwind positions?

Response: An air monitoring program will be established on the perimeter of the construction area. A site-specific health and safety plan will be developed that will insure the safety and protection of not only workers but residents. One of the things we will monitor is particulates coming from the site. If a certain level of particulates is reached, the work would cease until dust suppressants lower the levels to acceptable levels. Dust suppressant techniques will be used during the site work.

Comment 32: I'm concerned about runoff. If you don't remove enough of the contaminated soil you're going to stir up the pot when infrastructure is put in, especially a large building like a hotel.

If enough contaminated soil isn't taken out and contaminated soil is brought up to the surface, runoff may be a problem. I think EPA should spend the extra money, just to have an extra six-foot cushion so we can say that we've done our best and not something mediocre.

Response: With Alternative 4 and the excavation to six feet, there is a provision to place a visible demarcation barrier on the soils that remain at that six-foot interval, so anybody digging to that depth would see the barrier. This will also be addressed by imposing a deed restriction (*e.g.*, easement/covenant) which would prevent the disturbance of soils below six feet unless it is done in accordance with the SMP. The SMP will be developed to address any future issues with the soils below six feet, including runoff, should these soils be brought to the surface. However, based on correspondence and discussions with the City of Newburgh, EPA's remedy would be consistent with the City's anticipated future use of the site, which includes commercial, recreational, and restricted residential development. As such, the most likely use of the site will not require the need to go beyond six feet.

Comment 33: Scrap iron was removed from the site already; is that correct? You must have taken it someplace. Did you have to pay to have that done or did someone pick it up and take it out and give you money for the scrap?

Response: In an effort to clear the site in an expedient manner, a local scrap metal dealer was invited to remove the salvageable scrap from the property at no charge.

II. Written Comments Received During the Public Comment Period (July 25, 2006 - September 22, 2006)

Comment 1: Letter from Michael Curry, Newburgh resident, dated August 28, 2006. Mr. Curry's letter reiterates his concern about truck traffic and requests that the use of the CSX railroad track be evaluated for the transportation of site soils during removal and backfilling. Additionally, the letter raises the following concerns: With Alternative 3 being more comprehensive and expensive, is Alternative 4 the best long-term option or just an inexpensive solution for the EPA? And will the EPA's contractors utilize local labor?

Response: As noted in Comment 23, above, which addresses the truck traffic concern, use of the railroad will be evaluated during the

remedial design as a potential means of minimizing traffic disruptions and safety issues associated with heavy truck traffic.

With respect to the concern that EPA prefers Alternative 4 simply because it is less expensive, the preferred alternative is chosen after a detailed evaluation of all the alternatives against nine evaluation criteria, of which cost is only one. The Proposed Plan discusses each of these criteria (overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements (ARARs), long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, State acceptance, and community acceptance) in some detail and also includes a comparison of the alternatives against each other. The conclusion reached is that Alternative 4 provides the best balance of trade-offs among alternatives with respect to the evaluating criteria.

With respect to the question as to whether EPA's contractors will utilize local labor, it should be noted that EPA will first seek performance of the remedy by the major PRPs. Should they perform the work, EPA's role would become one of oversight to ensure that the remedy is implemented properly. Should the PRPs not perform the remedy, EPA would proceed using one of the pre-established contract vehicles available to us. Should bids be requested for sub-contracted tasks, the process would be available to all qualified bidders.

Comment 2: Letter from Jean McGrane, Newburgh City Manager, dated September 21, 2006. Ms. McGrane's letter urges EPA to consider a ROD that is specifically tailored to re-use of the site, recommending that contingency language be adopted in the decision document anticipating the City's detailed plans for the site to be available by the spring of 2007. The commentor, identifying lead, VOCs, and PCBs as the primary contaminants of concern, provides the following contaminant-specific recommendations:

a) Lead: According to the commentor, the site will likely be a mixed-use project, with high-density residential, commercial uses, parking lots, roadways, and impervious public space. Recognizing that the residential cleanup standard for lead of 400 ppm may be appropriate in certain areas of the site, imposing this standard to other areas of the site is not essential for the protection of human health and the environment and will result in unnecessarily expensive cleanup costs and greater delay in remediation. Accordingly, the commentor recommends that the ROD require excavation of lead impacted soil over 400 ppm down to the base of residential buildings, in backfill surrounding residential buildings, and to a depth of two feet in unpaved residential or public areas. For areas to be redeveloped as industrial or commercial buildings, the ROD should require excavation of lead-impacted soil over 800 ppm. Appropriate engineering and institutional controls could be combined with these proposed modifications to ensure protection of public health and the environment. The commentor also states that it does not make sense to require backfilling with clean soil in areas that will be re-excavated under the redevelopment. The commentor also takes issue with the potential hazards generated by the amount of truck traffic that would be involved with EPA's preferred remedy should that be the means to transport the soil to and from the site.

b) VOCs: The commentor states that since groundwater is not used as a potable drinking source and EPA's proposal includes restrictions on its use, VOCs need to be addressed only to the extent that they may be a potential threat to occupants of buildings and to biological receptors or humans via the Hudson River. As such, the commentor suggests that the ROD require a pre-design investigation to include additional wells and a soil gas survey. The results of such an investigation could then suggest potential remedial options such as soil removal, groundwater treatment systems, soil vapor extraction systems, sub-slab vapor barriers, natural attenuation, or combinations of any of these options.

c) PCBs: The commentor suggests that a combination of excavation of PCB-contaminated soil above 10 ppm and capping be applied similar to the proposal for lead-impacted soils (*i.e.*, excavation in residential and unpaved public areas, capping elsewhere).

Response: The response to the issues raised by the City of Newburgh is provided to correspond with each itemized medium.

a) Lead: The commentor suggests that the site remedy should precisely reflect different types of land uses that may be applied to this 7-acre site. While this may be practicable at a site where such reuse factors are well known, it is impracticable for the Consolidated Iron and Metal site. The City has provided EPA with its current schedule for the site's redevelopment but has not been able to provide the data (*i.e.*, specific site uses in specific areas). The site is currently zoned for mixed commercial, residential, and recreational use. Based on the City's future plans, EPA has determined that the reasonably anticpated future land use of the site is the same mixed use. EPA's proposed remedy is compatible with those land uses. In the absence of clear

locations for each use-type, in order for the remedy to be protective, EPA must assume the whole site could be used for residential purposes. Given the schedule of the planning process provided by the City for site redevelopment, applying an industrial cleanup PRG for portions of the site would impose limits on site use that are inconsistent with EPA policy set forth in the EPA Directive "Land Use in the CERCLA Remedy Selection Process." The potential residential use dictates that the residential lead cleanup PRG of 400 ppm be used. The cleanup depth of six feet applied across the site should not interfere with any future redevelopment, taking into consideration common architectural and building practices. This will essentially enable redevelopment within the City's zoning code across the entire site.

Furthermore, because the site has been contaminated with hazardous substances as a result of decades of industrial activities, EPA believes that it would be impractical to tailor cleanup based on what areas of the site may be designated residential versus commercial or recreational. Irrespective of whether a parcel is designated as residential, commercial, or recreational, development of that parcel, and all parcels across the site, would likely result in the disturbance of subsurface soils, due to construction of footings, foundations, sewers, and other utilities. For these reasons, EPA believes its selected alternative will leave the site in a manner that will be protective of future site occupants, site workers, and the residents of the City of Newburgh.

With respect to the issue regarding backfilling, EPA believes that backfilling the site to grade is also compatible with reasonably anticipated future land use. The clean fill will make site conditions safe for excavations to the depth of six feet; excavated soil from this depth can be disposed of as clean, reused elsewhere, or spread on-site for grading. Furthermore, given the lack of information as to the type and location of any building foundations, backfilling is preferable to leaving the excavation open for future considerations. If building foundations are ready to be installed at the site prior to the backfilling operation taking place then design or field changes can be used to accommodate such a scenario to prevent re-excavations of clean soil.

With respect to the amount of truck traffic in the implementation of the proposed remedy, use of the adjacent railroad and its associated costs will be evaluated as a transportation option to potentially minimize traffic disruptions and safety issues associated with heavy truck traffic.

b) VOCs: Although the site groundwater is not used as a potable drinking water source, it is classified by NYSDEC as a potential drinking water aquifer and EPA groundwater policy requires that we consider the State's designation when making remedy decisions. And although groundwater contamination is largely limited to one monitoring well, MCLs are exceeded. Accordingly, EPA's proposed remedy calls for institutional controls to prevent the use of the site groundwater unless groundwater quality standards are met, and monitoring of the groundwater to ensure that the contamination is attenuating and that groundwater quality continues to improve following the soil excavation. The pre-design investigation will include steps to define more precisely potential VOC source areas for excavation. Further, institutional controls will require that new construction be restricted unless an evaluation of the potential for vapor intrusion is conducted and mitigation, if necessary, is performed in accordance with the SMP. These groundwater remedy elements are fully protective of public health and the environment.

The commentor's suggestion that the ROD require a pre-design investigation to include additional wells and a soil gas survey to evaluate the need for potential remedial options such as soil removal, groundwater treatment systems, soil vapor extraction systems, sub-slab vapor barriers, natural attenuation, or a combination of any of these options may be necessary under the more limited excavation scenarios proposed by the City. However, EPA's FS considered the relevance of these factors in the development of the site alternatives and EPA's proposed groundwater response of institutional controls and monitoring is more cost-effective given the limited impact of contaminants to site groundwater.

c) PCBs: The commentor's comment on PCBs is essentially the same as with lead; that is, that the required excavation depths should take into account specific land use at specific locations on the site. This approach cannot be supported for the same reasons stated above, namely, that the type of multiple excavation scenarios specifically tied to yet-to-be-determined uses cannot be defined in a Superfund ROD. At best, EPA believes that the City's plan for redevelopment will be conceptual in nature. It is EPA's experience at other sites that the initially proposed redevelopment plans are subject to many revisions and are rarely, if ever, built as first proposed.

Comment 3: Letter from James D. McIver, Jr., consultant for Leyland Alliance, a development firm hired by the City of Newburgh, dated September 18, 2006. Mr. McIver's letter essentially reiterates concerns expressed by the City of Newburgh in its letter dated September 21, 2006, purporting that the ROD should reflect the future land use of the site with precision in order to economize on cleanup costs. As such, the commentor provides a modified Alternative 4 for consideration. The proposed modified Alternative 4 has the following elements:

- A Remedial Design program that includes construction issues in addition to filling in data gaps (*i.e.*, the design criteria should include future development plans);
- Removal of all debris and foundation material from the site;
- Excavation and on-site treatment using lead stabilization methods, off-site disposal of the stabilized soil with lead levels exceeding the total lead value of 800 ppm in those areas of the site where a direct exposure pathway would exist (*e.g.*, intensively used play spaces) to a depth of two feet;
- Excavation and off-site disposal of VOC- and PCB-impacted soil that exceeds the PRG for the protection of groundwater down to the water table;
- Re-using the stabilized soil to backfill excavated areas, as appropriate;
- Off-site disposal of the contaminated material encountered during the installation of building foundation and/or other support structures;
- Placement of a demarcation barrier to identify soils exceeding the total lead levels;
- Backfilling to grade and placement of a soil cap to eliminate exposure pathways; and
- Environmental easements/institutional controls.

Response: As most of the issues raised by the commentor are responded to in the response to the City of Newburgh's letter, this response will focus on the modified remedy proposed by the commentor; the bulleted responses below correspond to the bullets in the comment.

- **The remedial design program will be comprised of elements to support the construction of the site remedy as documented in the ROD, including construction issues. Specific future development plans would be included in the design program to the extent that they are defined at the time of the design and are compatible with the requirements of the ROD. For example, if building foundations are ready to be installed at the site prior to the backfilling operation taking place then design or** field changes can be used to accommodate such a scenario to minimize re-excavations of clean soil.

- Removal of all debris and foundation material from the site is a feature of the proposed remedy.
- On-site treatment using lead stabilization methods was not considered to be feasible due to the heterogeneous nature of the soil contamination. Lead is the most pervasive contaminant, but the soils also contain hazardous levels of PCBs and PAHs, which are not compatible with lead treatment technologies. Furthermore, applying the industrial cleanup value of 800 ppm for lead to the surface soil of a site where zoning includes residential use is prohibited by EPA policy and contrary to the findings of the site risk assessment.
- Excavation to the water table and off-site disposal of VOC- and PCB-contaminated soil that exceeds the PRG for protection of groundwater is a feature of the proposed remedy.
- Re-using stabilized soil is not feasible since the treatment technology is not feasible for heterogeneously contaminated soils. Re-use of treated soils would also limit what could be built on the site because of unpredictable structural characteristics.
- Off-site disposal of the contaminated material encountered during the installation of building foundations or other support structures is accommodated by proposed remedy which will excavate to a depth of six feet. For foundations and support structures that may extend below six feet in depth (an issue raised by the commentor elsewhere in the comment letter), construction would not be prohibited, but rather would have to be carried out in accordance with the SMP to assure proper handling of the soils for the protection of future site occupants, the site workers, and the surrounding community. Depending on the results of testing, these soils could be backfilled at depths below six feet or disposed of off-site.
- Placement of a demarcation barrier to identify soils exceeding the PRG for lead is a feature of the proposed remedy (the only difference being that the PRG for lead under the proposed remedy is 400 ppm, based on residential, as opposed to the commentor's suggestion that the industrial lead PRG of 800 ppm be utilized wherever possible).
- Backfilling to grade to eliminate exposure pathways is a feature of the proposed remedy.
- Institutional controls in the form of easements/covenants are included in the proposed remedy.

Comment 4. Letter from Thomas D. Morris, Project Manager, Corporate Environmental Affairs, International Business Machines (IBM), dated September 22, 2006. The letter, along with a report prepared by IBM consultants, contains the following comments:

1. The ash/slag pile is not the source of lead and PAHs in the surface or subsurface soil in the process area or across the site. This most likely is also true of other metals.

2. These substances in site soil most likely were contained in the fill when it was brought to the site, much of it prior to 1884 and most of it prior to 1940 before Consolidated Iron and Metal Company Inc. operations began.

3. Leaching of VOCs from soils on the site is not the most likely source of VOCs detected in groundwater beneath the site. Evidence suggests that aromatic hydrocarbons and MTBE in groundwater may originate from upgradient sources west of the site. Searches of the environmental databases confirm the existence of potential sources for these contaminants in the area west of the site.

4. Alternative 2 is the most appropriate remedy at the site. It is protective of human health and the environment, protects against residual risks and has major advantages in short-term effectiveness, implementability, and cost. It also reduces mobility of hazardous substances in soil and achieves PRGs to a depth of two feet bgs, thus eliminating risks associated with exposure to surface soil.

Response: Comments 1, 2, and 3 are comments on the RI/FS, specific to the origin of site contamination. The comments refute EPA's findings in those reports with respect to the derivation of site waste. EPA's documentation shows that the site contamination is clearly due to the operations of Consolidated Iron and Metal Company Inc. and this conclusion is supported by the historical record, data collection and analysis, as well as interviews with and a deposition of owner of Consolidated Iron and Metal Company Inc. The documentation in the site administrative record amply supports a cause and effect relationship between the lead, PCBs, PAHs, VOCs, and large quantities of debris found in site media and the operations of the site by Consolidated Iron and Metal Company Inc. However, regardless of the origin of the contamination, the commentor does not dispute the fact that the site is contaminated

nor that a response action is warranted.

With respect to comment 4, that Alternative 2 is the most appropriate remedy for the site, EPA disagrees. The comment cites advantages in short-term effectiveness, implementability, and cost, which is supported by EPA's comparative analysis of alternatives. The comment also states that it reduces mobility of hazardous substances in soil and eliminates risks associated with exposure to surface soil by achieving PRGs to two feet. The mobility of hazardous substances is reduced somewhat by limiting contaminant migration due to rainwater leaching through soils to groundwater, erosion, and fugitive dust. However, the criterion used in the comparative analysis of alternatives also considers reduction of volume of contaminated material; by this standard, Alternative 2 provides none. EPA's proposed remedy will remove approximately 78,000 cubic yards of contaminated soils from the site and the clean backfill will prevent leaching, erosion, and fugitive dust. Alternative 2 is also less compatible than Alternative 4 with reasonably anticipated future land use. The site is zoned for mixed use, including commercial, residential, and recreational uses, and the City has taken preliminary steps to ensure redevelopment of the site consistent with these uses. A two-foot cap (Alternative 2) that could not be breached would interfere with the City's plans for redevelopment of the site, which would necessarily involve intrusive construction activities. If the two-foot soil cap were compromised, it would no longer be protective of human health and the environment. EPA's proposed remedy is consistent with the reasonably anticipated future land use of the site and takes into account standard building practices to provide a protective remedy. The commentor's proposal that Alternative 2 be adopted as the site remedy also does not take into account typical goals associated with Superfund hazardous substance sites. Hazardous substance sites need to be dealt with commensurate with the nature of the hazardous substances present. An important element of hazardous substance site remediation under Superfund is contaminant source removal. EPA's proposed remedy includes design work to provide the detail needed for contaminant source removal. All of these elements considered, EPA believes Alternative 4 to be the most cost-effective solution applying the evaluation criteria given reasonably anticipated future land use of the site.

Comment 5: Letter from Michael D. Tamburri, small business owner, dated September 21, 2006. Mr. Tamburri's letter expands upon comments received at the public meeting regarding small business owner liability at the site. According to Mr. Tamburri, Consolidated Iron and Metal Company Inc. ("Consolidated") was licensed by the State of New York, subject to renewal every three years, as a salvage and dismantling yard. The license was such that the State could regulate the company's operation, including the disposal of toxic materials under the guidelines of the law. Mr. Tamburri says the small business owners who brought vehicles to this site were never notified by any agency not to bring the vehicles due to toxic material found in cars. Mr. Tamburri's comment raises two major issues: a) why would the company's license be continually renewed in light of the hazardous material releases which occurred throughout the site's time of operation? and b) why are the small business owners who relied on the licensing now being held liable for cleanup costs?

Response: EPA does not have all the specifics about the licensing of the facility because it was done by both the City of Newburgh and the State of New York. We do know that the City and the State both inspected the site on numerous occasions from the 1950's through the 1990's and found many instances of environmental non-compliance. The City cited Consolidated a number of times from the 1950's through the 1990's. Several environmental enforcement actions were brought against Consolidated in the 1970's through the 1990's by New York State, the United States, and the City. The local newspapers, including the <u>Times Herald Record</u>, the <u>Poughkeepsie Journal</u> and the <u>Newburgh Evening News</u> published articles on the enforcement actions.

Moreover, notwithstanding whether Consolidated was a licensed facility, the Superfund law is a strict liability statute, meaning it imposes liability on certain classes of parties without regard to fault. Consequently, even if you relied on the site being a licensed facility, if you sent cars or other materials that contained hazardous substances to the site and there was a release which caused the government to spend money, you are considered a potentially responsible party at the site. The Superfund law also applies retroactively, so that it reaches back in time to activities done many years ago, even if they were legal at the time. The statute is written so that it only addresses the liability of people who owned or operated the site or generated or transported the hazardous substances that were brought to the site. Agencies that permitted the facility do not fall within these liability provisions. However, the government can take into consideration a potentially responsible party's ability to pay, so if you receive a letter from EPA telling you that you have potential liability at the site, EPA can consider an inability to pay the full amount.